NOAA Research

Office of Oceanic and Atmospheric Research

FY2001 Operating Plan

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FY 2001 OPERATING PLAN

NOAA's Office of Oceanic and Atmospheric Research (OAR) strives to balance its near-term responsibility to address the needs of its primary customers both inside and outside of NOAA with its longer-term commitment to conduct visionary research that will be critical for managing future environmental and societal threats. This dual responsibility requires us to perform research that leads to the transfer of information and new technologies, as well as to explore the unknown and develop important new concepts.

Vision: A society that uses the results of our research as the scientific basis for more productive and harmonious relationships between humans and their environment.

Mission: To conduct research, develop products, and provide scientific information and leadership toward fostering NOAA's evolving environmental and economic mission.

1.0 PROGRAM INFORMATION AND PLANNED ACCOMPLISHMENTS

OAR accomplishments planned for FY 2001 are organized into Objectives, Performance Measures (PM), and Milestones in support of five of the seven goals contained in the NOAA Strategic Plan:

1. Sustain Healthy Coastal Ecosystems
2. Build Sustainable Fisheries
3. Advance Short-Term Warnings and Forecast Services
4. Implement Seasonal to Interannual Climate Forecasts
5. Assess and Predict Decadal to Centennial Change

The last page of this section contains two tables showing the number of milestones expected to be accomplished by each of OAR's organizational units, one distributed by Fiscal Year Quarter and the other by Strategic Plan Goal. Abbreviations used throughout this document can be found in Appendix A.

1.1 OAR MANAGEMENT MILESTONES

Q1	Review GLERL science programs and management. (D. Stein)	OAR HQ
Q1	Complete an initial Implementation Plan for a Sustained Ocean Observing System to support Climate and Marine Services. (B. Molinari)	AOML
Q1, Q3	The NOAA Science Advisory Board will meet at least twice each year for the purpose of advising the Under Secretary of Commerce for Oceans and Atmosphere on long- and short-range strategies for research, education, and application of science to resource management. (M. Uhart)	SAB
Q2	Define ship and aircraft needs for FY 2002 and FY 2003. (F.W. Rossman)	OAR HQ; OMAO
Q2	Review National Research Council (NRC) Research Associate applicants. (J.P. Schmidt)	OAR HQ
Q2	Review Mid-Atlantic Bight National Undersea Research Center management and science. (A. Kalvaitis)	NURP
Q2	Provide NOAA with sample authorizing language for the National Undersea Research Program, which the Administration can use during the next session of Congress. (B. Moore)	NURP
Q2	Review ARL management and science. (P. Whung)	OAR HQ
Q3	Review Applied Research Centers to assess progress in prediction research. (P. Arkin)	OGP
Q3	Produce report describing OAR's strategy and priorities for Arctic science for FY 2002 - FY 2006. (J. Calder)	ARO
Q4	As a continuation of research collaborations with our university and non-profit research partners, the NOAA/OAR Joint Institutes will begin a new set of 5-year plans to be in effect from July 1, 2001 to June 30, 2006. (M. Moll)	OAR HQ
Q4	Review CDC management and science. (K. Koch)	OAR HQ
Q4	Report on conversion of major model codes at GFDL to run on the new scalable supercomputer. (B. Ross)	GFDL
Q4	The NOAA Panel on Climate and Global Change will meet three times per year to evaluate and improve the program for scientific quality and for relevance to NOAA's goals and the needs of the scientific community. The meeting results will be published. (S. Auer)	OGP
Q4	Produce summary of NOAA's scientific investigations in the Arctic: An overview for the non-scientist. (J. Calder)	ARO

Q4	Start Phase III - DESIGN for the Norman Consolidation project, allowing NOAA to start lease negotiations with the University of Oklahoma. (D. Forsyth)	NSSL
Q4	Prepare a NOAA-wide strategy paper to define future cooperation with China in marine and fishery science and technology. This document will help NOAA set priorities for cooperation with China over the next five years under the U.S-China Marine and Fishery S&T Protocol and the U.S.-China Forum on Environment and Development. (D. Jang)	IA
Q4	Begin planning for an enlarged ocean exploration program by convening several regional workshops. (B. Moore)	NURP
Q4	Establish an OCEAN.US program office and begin administrative planning and operations. (S. Piotrowicz)	OAR HQ

1.2 OAR PROGRAM MILESTONES

1.2.1 SUSTAIN HEALTHY COASTS

OBJECTIVE 1: Protect, Conserve, and Restore Coastal Habitats and their Biodiversity

Percent Reduction in the Loss of Coastal Habitat Quality and Quantity

PM: *Percent of coastline with threats ranked and assessed*

Q1 Support research to describe the ecology, threats to and health of coastal ecosystems that are particularly sensitive to global change and anthropogenic impacts, including coral reefs and polar regions. (E. Myers) NURP

Q3 Develop methods to quantify the contribution of atmospheric deposition as a threat to sensitive coastal habitats. (R. Artz) ARL

Percent of Damaged Coastal Habitats Restored in Quality and Quantity

PM: *Number of tools and technologies that enhance habitat restoration*

Q1 Support research and outreach activities which will protect and enhance the health of coastal ecosystems by improving the quality of coastal and Great Lakes waters and promoting understanding of coastal and Great Lakes ecosystems. (L. Cammen & V. Panchang) SG

Q2 Develop technologies to collect long-term, continuous ocean observations needed to monitor the health of important coastal ocean habitats. (E. Myers) NURP

Q4 Develop technologies and procedures to assist in wide-area, rapid assessment, mapping and description of coastal habitats associated with areas of high coastal development and threatened ecosystems. (E. Myers) NURP

PM: *Number of coastal regions with reduced introductions and impacts of non-indigenous species*

Q3 Determine distributions of the amphipod *Diporeia* spp. throughout Lake Michigan and changes over the past 5 years due to the introduction of the zebra mussel in 1989. (T. Nalepa) GLERL

OBJECTIVE 2: Promote Clean Coastal Waters to Sustain Living Marine Resources and to Ensure Safe Recreation, Healthy Seafood, and Economic Vitality

Percent Reduction In Nutrient Pollution And Impacts On Coastal Waters

PM: *Percent of US coastal regions with assessments of atmospheric pollution effects on water quality*

Q4	Present the outcome of a two-year study to assess the state of knowledge regarding relative nitrogen inputs from the atmosphere to a set of representative watersheds of the contiguous United States. (B. Hicks)	ARL

PM: *Number of coastal and Great Lake states provided with improved predictive capabilities and understanding of coastal processes*

Q1	Complete and report on studies of the impact of seasonal factors on the bioaccumulation of PCB congeners by the amphipod *Diporeia* spp. in the Great Lakes. (P. Landrum)	GLERL
Q2	Support research, development and outreach/implementation of advanced technologies which are critical to the economic health of the coast, enhance environmental monitoring, assessment and remediation of coastal areas and/or enhance understanding of coastal environmental processes. (L. Kupfer & L. Cammen)	SG
Q2	Complete a new high resolution bathymetry for Lake Huron and prepare for distribution. (D. Reid, T.L. Holcombe, & D. Divins; NESDIS/NGDC)	GLERL/ CIRES
Q2	Complete and report on investigations of the capability of Lake Michigan sediments for resuspension based on studies using an *in situ* flume. (N. Hawley)	GLERL
Q2	Complete and report on investigations of single cell measurements of important phytoplankton processes. (G. Fahnenstiel)	GLERL
Q3	Complete the preliminary assessment of the wave grouping effects in near-shore Lake Michigan. (P. Liu)	GLERL
Q3	Complete data collections describing currents and water circulation during summer and winter conditions in Burlington and Shelburne Bays, Lake Champlain. (J. Saylor)	GLERL
Q3	Support research, development, and outreach for ports and harbors and marinas that will improve planning and operations. (V. Panchang & V. Omelczenko)	SG
Q3	Complete Chesapeake Bay project report on currents and particulate matter movements at disposal site 104 in Chesapeake Bay. (J.R. Proni)	AOML
Q3	Describe the processes that control the distribution and impacts of pollutants and nutrients on sensitive coastal ecosystems. (E. Myers)	NURP

Q4	Initiate real-time data acquisition and assimilation from South Florida Ecosystem Restoration Prediction and Modeling Program. (P.B. Ortner)	AOML
Q4	Determine modern sediment accumulation rates in Lake Michigan. (J. Robbins)	GLERL
Q4	Describe the seasonal mesoscale patterns of plankton along onshore-offshore transects in southern Lake Michigan and evaluate the importance of these patterns to developing a monitoring program of the lake. (H. Vanderploeg)	GLERL
Q4	Complete improvements to the algorithm developed for Great Lakes ice cover classification and mapping using satellite SAR data. (G. Leshkevich)	GLERL

PM: *Number coastal ecosystems with inventories, databases or assessments of water quality and natural resources*

Q2	Complete all field work for the 6-year NOAA-NSF Coastal Ocean Program "The Impact of Episodic Events on the Great Lakes" and report results to NOAA-COP, NSF, and on the web. (B. Eadie & D. Schwab)	GLERL

OBJECTIVE 3: Foster Well-planned and Revitalized Coastal Communities That Are Compatible with the Natural Environment, Minimize the Risk from Natural Hazards, and Provide Access to Coastal Resources for Public Use and Enjoyment

Number of coastal counties with improved hazard mitigation plans incorporating risk and vulnerability information

PM: *Cumulative percent of shoreline and inland areas with improved ability to identify extent and severity of coastal hazards*

Q3	Conduct coastal research and/or outreach addressing any of the following: severe storms, earthquakes and tsunamis, coastal planning and building construction and shoreline processes and erosion. (V. Panchang & J. Eigen)	SG

PM: *Number of improved information management tools developed to assist coastal hazard mitigation*

Q3	Produce tsunami maps for threatened U.S. coastal communities. (F. Gonzalez)	PMEL
Q4	Develop improved understanding of and techniques for predicting coastal hazards. (E. Myers)	NURP
Q4	Conduct research to understand changes in the Vents deep-ocean ecosystem at the NeMO seafloor observatory. (S. Hammond)	PMEL

Percent of coastal communities that track locally defined indicators showing a "positive trend" as defined by those indicators

PM: *Number of activities conducted to provide a technically trained work force and environmentally informed citizenry (24 in FY00)*

Q1	Through both formal and informal educational and outreach mechanisms, improve public understanding of marine and coastal issues and processes and/or increase the number of resource managers/policy makers knowledgeable about marine and coastal issues and processes, and/or educate and support students needed to sustain the field of marine and coastal science. (E. Day & J. Murray)	SG
Q3	Conduct outreach/educational activities for students and citizenry so that they better understand the oceans and their role and impacts on human welfare. (E. Myers)	NURP

PM: *Number of models for new commercial products and industrial processes based in bio-products from marine organisms.*

Q4	Investigate new products from the sea using state-of-the-art exploration and biotechnology techniques. (E. Myers)	NURP

1.2.2 BUILD SUSTAINABLE FISHERIES

OBJECTIVE 1: Eliminate and Prevent Overfishing and Overcapitalization

PM: *By 2005, reduce by 40% (34) the number of overfished fisheries (Currently 86 of 269 fisheries are overfished.*

Q1	Conduct airborne lidar survey in the Gulf of Alaska. (J. Churnside)	ETL
Q2	Contribute to improved stock assessments for species that are not accessible to towed sampling gear. (E. Myers)	NURP
Q2	Report on initial studies to evaluate the impact of declining food resources on Great Lakes fishes. (S. Brandt & T. Nalepa)	GLERL
Q3	Conduct research to develop a science-based methodology for forecasting the annual recruitment of Bering Sea pollock stocks. (P. Stabeno)	PMEL
Q4	Support research on reduction of commercial by-catch, rebuilding fisheries that have declined, influence of physical factors on fisheries, modeling and prediction of fishery stocks, and development of better assessment methods to determine the status of fishery stocks. (E. Anderson & J. McVey)	SG

PM: *By 2005, 60% of stocks will have sufficient and protected "essential fish habitat"*

Q1	Define Essential Fish Habitat (EFH), e.g. physiography and how the fish use the habitat, for at least four species of declining fisheries. (E. Myers)	NURP

OBJECTIVE 2: Attain Economic Sustainability in Fishing Communities

PM: *By 2005, 10% increase in employment in non-capture fishing and/or other sectors*

Q2	Assess the effectiveness of Marine Protected Areas (MPAs) for sustaining and enhancing fisheries and EFH. (E. Myers)	NURP
Q3	Determine the impacts of precious coral harvesting as determined by molecular genetics in the Hawai'ian Island Management Units. (E. Myers)	NURP
Q3	In partnership with other private and public sector entities, conduct multi-disciplinary research and outreach focused on sustainable development policies for marine communities in order to identify key processes and mechanisms underpinning the dynamics of these marine communities and to identify opportunities for sustainable economic development and diversification. (F. Schuler & J. Eigen)	SG

OBJECTIVE 3: Develop Environmentally And Economically Sound Marine Aquaculture

PM: *Promote Safe Seafood*

Q4 Support research and outreach and develop technologies and techniques that will decrease costs, ensure high-quality and safe products, and improve waste management for seafood. (J. Murray & L. Kupfer) SG

PM: *By 2005, 18% increase in economic contribution of aquaculture to Gross Domestic Product. (1% by 2001)*

Q2 Support projects to improve culture systems, genetics, nutrition, disease diagnosis and control and biotechnology leading to an expanded aquaculture sector. (J. McVey & E. Anderson) SG

1.2.3 ADVANCE SHORT-TERM WARNINGS & FORECAST SERVICES

OBJECTIVE 3: Enhance Observations & Prediction

North American Observing Systems/U. S. Weather Research Program

Q1	Complete NAOS report and recommendations for adaptive observing. (A.E. MacDonald)	FSL
Q1	Report on Profiler data denial experiment. (T. Schlatter)	FSL
Q3	Complete NAOS report and recommendations for observations of hurricanes. (A.E. MacDonald)	FSL
Q4	Evaluate technology for proposed space-based Doppler Wind lidar. (B. Rye & M. Hardesty)	ETL
Q4	Perform targeted airborne observing experiment over Pacific coastal storms or Atlantic hurricanes. (A.J. Gasiewski)	ETL
Q4	Assess the ability of polarization radar to quantify snow amounts and discriminate between freezing rain and snow. (D. Zrnic)	NSSL

Optimal Mix/Data Assimilation/QPF

Q2	Develop and evaluate new stochastic dielectric breakdown model of lightning for numerical cloud models. (D. MacGorman)	NSSL
Q3	Obtain and install new 3D lightning mapping system in Central Oklahoma. (D. MacGorman)	NSSL
Q3	Determine electrical structure of various supercell thunderstorm types. (D. MacGorman & D. Rust)	NSSL
Q4	Conduct PACJET-2001 field experiment to improve short-term forecasting of land-falling Pacific storms, including local watershed impacts. (F. Ralph)	ETL

Hurricanes at Landfall

Q3	Complete validation of currently accepted parametric hurricane wind profiles used in storm-surge and catastrophe models against archived aircraft observations. (H.E. Willoughby)	AOML
Q3	Perform targeted/adaptive observing experiments in and near Atlantic hurricanes. (S.D. Aberson)	AOML; NWS
Q3	Formulate a forecasting tool for hurricane intensity prediction using TOPEX/POSEIDON (Altimetry Research in Ocean Circulation) and oceanic data. (G.J. Goni & P.G. Black)	AOML

Technique and Technology Research and Development

Q2	Install the next generation 915 MHz radar wind profiler on R/V Ronald H. Brown. Compare wind products with radiosonde data. Determine percent increase in high-quality wind data with respect to older technology. (M.J. Post)	ETL
Q4	Characterize performance of unattended water vapor profiling lidar under various atmospheric conditions with different temporal and spatial averaging. (J. Machol)	ETL
Q4	Complete the design of a new Ground-based Remote Icing Detection System (GRIDS). (R. Reinking, D. Hazen, & R. Kropfli)	ETL
Q4	Complete analysis of and report on the latest differential propagation phase shift measurements for improved rainfall estimation with X-band radar. (S. Matrosov)	ETL
Q4	Complete installation of the WSR-88D research test bed radar. (D. Zrnic)	NSSL

HPCC

Q2	Install the new High Performance Computing System at GFDL. (B. Gross)	GFDL
Q3	Report on progress in optimizing the new scientific productivity achieved from the new supercomputer system. (B. Ross)	GFDL
Q4	Bring FSL massively parallel processor to operations with 500 processors. (M. Kraus)	FSL

National Space Weather Program

Q2	Acquire, configure, and bring online a Beowulf system for advanced model development. (J. Abeyta)	SEC
Q2	Deliver final observing sequences for GOES N/Q Solar X-ray Imager flight model. (V. Pizzo)	SEC
Q3	Implement empirical storm-time ionospheric correction model, in real-time, driven by Ap (Geomagnetic Index). (T. Fuller-Rowell)	SEC
Q3	Complete development and testing of operational ground data system for GOES-M Solar X-ray Imager. (S. Hill)	SEC

Communication and Navigation (Signal Interruption) Products

Q4	Hazardous materials exposure forecasting: Implement data-assimilative dispersion forecast for forest fire smoke. (R. Draxler & B. Hicks)	ARL

National Tsunami Hazard Mitigation Program

Q4	Complete an experimental network of real-time, deep-ocean, tsunami detection moorings. (F. Gonzalez)	PMEL

1.2.4 IMPLEMENT SEASONAL TO INTERANNUAL CLIMATE FORECASTS

OBJECTIVE 1: Implement Prediction Systems

PM: *Expand the capabilities and usefulness of NOAA's climate services by implementing new climate forecast products.*

Q1 Implement and evaluate the skill of experimental statistical forecasts which use subseasonal variations in tropical outgoing long-wave radiation to forecast precipitation at a range of 8-14 days over the western United States. (J. Whitaker) — CDC

Q2 Implement experimental two-to-six week forecasts using a new empirical-dynamical model, compare the skill of this model with that of current NOAA climate forecast models, and make the results available in real-time on the World Wide Web. (M. Newman) — CDC

Q3 Evaluate the progress of new laboratory-wide Flexible Modeling System and its evolving utility as the platform for launching all of GFDL's weather/climate simulation experiments. (J. Anderson) — GFDL

OBJECTIVE 2: Maintain and Improve Observing and Data Delivery Systems

PM: *Respond to customer demand by increasing the number of operational and research data sets updated, developed, produced and delivered.*

Q4 Create at least two new suites of Web documents describing CDC research and its implications, with one suite using language appropriate for the general public and the other addressing needs of the climate research community. (D. Mock & J. Collins) — CDC

PM: *Increase the cumulative number of ocean observations that are critical for improving climate analyses and forecasts. (Metrics: Number of platforms (of given types) globally reporting near real time data.*)

Q1 Re-activate the continuous series of Florida Current transport measurements by instrumenting the submarine cable between Florida and the Bahamas. (W.D. Wilson) — AOML

Q2 Enhance the real-time data output from TAO/TRITON Array through the addition of ocean current, solar radiation, and barometric pressure measurements to selected TAO/TRITON moorings to provide estimates of heat, moisture and momentum fluxes. (M. McPhaden) — PMEL

Q4 Deploy the first 40 floats in the Atlantic Ocean for the Argo project and develop procedures for real-time quality control of the data. (R.L. Molinari) — AOML

Q4 Establish an objective process for decisions related to justification, design, maintenance, and evolution of the climate observing system. (M. Johnson) — OGP

OBJECTIVE 3: Conduct Research for Improved Climate Predictions

PM: *Improve understanding of atmospheric, oceanic, land surface and cryospheric processes that contribute to seasonal-to-interannual climate variability, as measured by peer-reviewed publications from NOAA-supported research programs.*

Q2	Demonstrate in the central U.S. on an existing 35 GHz cloud radar that insects and cloud signals can be decoupled using polarization characteristics on the radar echoes. (K. Moran)	ETL
Q2	Assess the nature of the interannual and intraseasonal variability of the global tropopause, and link such fluctuations to variations of the troposphere and lower stratosphere. (G. Kiladis)	AL
Q3	Assess impacts of projected greenhouse warming on Great Lakes regional water resources. The primary deliverable is a suite of projections of changes in Great Lakes water levels due to increased greenhouse gases. Additional deliverables include corresponding net basin supplies of water to each of the Great Lakes and outflows from the lakes. (B. Lofgren)	GLERL
Q3	Convene an CLIVAR-Atlantic Workshop at CDC and report on significant new research results on extratropical atmosphere-ocean interactions. (M. Alexander)	CDC
Q4	Complete a report on seasonal predictability of temperature and precipitation based on results derived from climate models used by the National Centers for Environmental Prediction and the International Research Institute for Climate Prediction. (M. Hoerling)	CDC
Q4	Complete a statistical analysis of Great Lakes ice cover for a 23 winter base period (1973-1995). (R. Assel)	GLERL
Q4	Explore the seasonal cycle and intraseasonal variability of near equatorial meridional winds over the central Pacific using over a decade of wind profiler observations at Christmas Island, with the aim of better understanding climate variability. (K. Gage)	AL
Q4	Complete GCIP (GEWEX Continental-scale International Project) regional studies in Missouri River Basin. (R. Lawford)	OGP

PM: *Improve NOAA model capabilities to simulate seasonal-to-interannual climate variability by decreasing errors in sea-surface temperatures, sea level pressure, wind and precipitation fields (metrics: reductions in root-mean-square errors, increases in anomaly correlations over standard periods, e.g., 1979-98 or test cases, relative to "baseline" model skill)*

Q3	Complete a modeling study of the oceans role in tropical Atlantic climate variability. (J. Todd)	OGP
Q3	Complete a modeling study of the role of teleconnections on tropical Atlantic climate variability. (J. Todd)	OGP

Q4 Calculate the radiative feedbacks of water vapor and clouds using ERBE observations and CCM3 simulations for the ERBE period. Identify possible causes for the discrepancies between observations and coupled model simulations and assess whether these discrepancies can account for the bias in the equatorial SST in the coupled model simulations. (D. Sun) — CDC

OBJECTIVE 4: Assess Socio-economic Impacts of Climate Variability and Deliver Climate Services

PM: *Develop synthesis of regional experiences in the production, dissemination and application of climate forecast information during the 1997-98 event.*

Q1 Develop recommendations for optimal strategies for regional climate information systems based on experiences during the 1997-98 El Niño event to deliver improved climate information to end users. (C. Clark) — OGP

PM: *Assess the socio-economic impacts of seasonal-to-interannual climate variability by completing analyses of vulnerability and coping strategies within regions and sectors (Metric: number of reports completed on regional or sector-based analyses)*

Q2 Initiate series of public reports on key climate sensitivities in the regions under study in the Regional Integrated Sciences and Assessment (RISA) Program. (R. Pulwarty) — OGP

Q2 Conduct and report on results of a special session at the AGU Fall 2000 meeting on regional trans-boundary water management issues. Topics will include: impacts of changes in the water cycle in the context of human intervention, relationships between climate, water quality, and aquatic ecosystems, societal aspects of water resource management, and trans-boundary regional water management strategies and case studies, especially those that help place climate-forced changes in regional water supplies in a societal context. (H. Diaz) — CDC

Q3 Site visit and comprehensive review of the CLIMAS project (SW Regional Assessment). (R. Pulwarty) — OGP

Q4 Host a workshop to review the state of knowledge and identify critical gaps for research on vulnerability to climates. (C. Simpson and R. Pulwarty) — OGP

1.2.5 DOCUMENT, PREDICT AND ASSESS DECADAL-TO-CENTENNIAL CHANGE

OBJECTIVE 1. Characterize the Forcing Agents of Climate Change

PM: *Results of 90% of the research activities are to be cited in the year-2001 Intergovernmental Panel on Climate Change (IPCC) Third Assessment of Climate Change*

Subject: *Global monitoring, process studies, and modeling associated with greenhouse gases*

Q2	Produce a quantitative description of the global tropospheric distribution of nitrogen oxides, including its natural and anthropogenic sources. (H. Levy)	GFDL
Q2	Report on stratospheric water vapor measurements. (S. Oltmans)	CMDL
Q2	Analyze the climate warming of the 20th century in comparison to GFDL coupled climate model simulations. (T. Knutson)	GFDL
Q3	Update the global trends in long-lived greenhouse gases. (D. Hofmann)	CMDL
Q3	Contribute to the international assessment of water vapor, being prepared under the auspices of the international program Stratospheric Processes and their Role in Climate (SPARC), to better understand the role of water vapor in the climate system. (K. Rosenlof)	AL
Q3	Characterize the global distribution of atmospheric nitrogen dioxide and provide estimates of its role in radiative forcing. (S. Solomon)	AL

Subject: *Monitoring, process studies, and modeling associated with climate related aerosols*

Q1	Provide a report on the climate-forcing characteristics of aerosols monitored at North American sites. (J. Ogren; J. Levy)	CMDL; OGP
Q3	Report on the key findings of, and the contributions of GFDL to, the IPCC 2001 climate change assessment. (R.J. Stouffer)	GFDL

Subject: *Carbon dioxide: global and regional sources and sinks*

Q2	Complete the fabrication of an autonomous near-surface profiler of temperature and O_2. Collect temperature, O_2, and CO_2 profiles during GasEx-2001 cruise to study magnitude and causes of variability. (R.H. Wanninkhof)	AOML
Q3	Complete synthesis of all the inorganic data obtained in the Atlantic during the World Ocean Circulation Experiment, Joint Global Ocean Flux Study, and NOAA-Ocean Atmospheric Carbon Exchange Study campaigns. (R.H. Wanninkhof)	AOML
Q3	Develop an implementation strategy for oceanic and atmospheric observations necessary to improve understanding of the variability and future evolution of atmospheric carbon dioxide concentrations in order to improve climate predictions. (L. Dilling)	OGP

Q4	Conduct research and provide a synthesis of Pacific Ocean carbon survey data. (R. Feely & C. Sabine)	PMEL

OBJECTIVE 2: Understand the Role of the Oceans in Global Change

PM: *Results of 90% of the research activities are to be cited in the year-2001 Intergovernmental Panel on Climate Change (IPCC) Third Assessment of Climate Change*

Subject: *Document climate variability through instrumental and paleoclimate records*

Q2	Describe the range and potential causes of climatic "surprises" observed in the paleo-record, but not in the instrumental record. (K. Mooney)	OGP

Subject: *Improved understanding of the role of the oceans in the coupled ocean-atmosphere system*

Q4	Compare instrumental and paleo-record data with model simulations. (K. Mooney)	OGP

OBJECTIVE 3: Ensure a Long-Term Climate Record

PM: *Results of 90% of the research activities are to be cited in the year-2001 IPCC Third Assessment of Climate Change*

Subject: *Data archeology and data set enhancement*

Q2	Provide updated and improved 40-year atmospheric temperature data base for use in IPCC. (J. Lanzante; D. Gaffen)	GFDL; ARL; NESDIS
Q2	Review the information about observed changes in temperature, precipitation, cloudiness, water vapor, and atmospheric circulation. (B. Hicks)	ARL; NESDIS
Q4	Complete an update of the Comprehensive Ocean-Atmosphere Data Set covering approximately 1800-1949, including a blend with the UK Main Marine Data Bank and other newly available sources. This update will substantially lengthen the period of record (presently 1854-1997), and make available the entire archive in uniform formats. (S. Woodruff)	CDC
Q4	Complete hydrometerological station directory database and map interface on the world wide web with the Great Lakes Commission. (T. Croley)	GLERL

Subject: *Reconstruction of past climates*

Q3	Provide updated and improved global database and data access/visualization tools to provide decadal to millennial length series of climate variability and forcing. (K. Mooney; M. Eakin)	OGP; NESDIS

OBJECTIVE 4: Guide the Rehabilitation of the Ozone Layer

PM: *Results of 90% of the research activities are to be cited in the 2002 UNEP/WMO Assessments of Ozone Layer Depletion*

Subject: *Predicting, detecting, and characterizing the recovery of the ozone layer*

Q1	Present OAR findings from the 1999-2000 international "SOLVE/THESEO" Arctic ozone field experiment, to elucidate the chemical and dynamical factors that influence ozone layer depletion in the Arctic polar region. (D. Fahey; J. Elkins)	AL; CMDL
Q2	Analyze the chlorine and bromine content of aerosols in the tropopause region, with the aim of better understanding the role of aerosols in the depletion of ozone in the stratosphere. (D. Murphy)	AL
Q4	Report on the status of the Dobson ozone network. (S. Oltmans)	CMDL

Objective 5: Provide the Scientific Basis for Improved Air Quality

PM: *Results of 90% of the research activities are to be cited in the 2002 NARSTO Assessment of Fine-Particulate Matter*

Subject: *Early detection of improved air quality*

Q4	Report updated baseline trends from the AIRMoN sites. (B. Hicks)	ARL
Q4	Evaluate the effectiveness of the Clean Air Act in lowering the acidic deposition levels in the Northeastern U.S. based on observed trends. (B. Hicks)	ARL

Subject: *Science underpinning air quality standard setting: ozone and particulate matter*

Q3	Complete year-long field study of meteorological processes controlling ozone and fine particulates over mesoscale domains in central California. (W. Neff & J. Wilczak)	ETL
Q4	Analyze experiment results from Nashville and Houston Air quality studies to investigate effects of transport on local air pollution. (C. Senff & R. Banta)	ETL

Q4 Participate in and assist in the organization of a first data workshop to discuss the results of the 2000 Texas Air Quality Study, which aims to characterize the unique Gulf-inflow, hydrocarbon-refinery, and urban air quality processes of the Houston region to meet emerging information needs of regional decision makers. (J. Meagher) AL

Q4 Participate in and assist in the organization of a workshop that will identify international research activities to better understand the impact of long-range intercontinental transport of pollutants on "background" air quality in the U.S. (F. Fehsenfeld) AL

OBJECTIVE 6: Furnish Prediction, Assessment, & Human-Impacts Information

PM: *90% of the Principal Investigators are to be involved in the relevant portions of the Intergovernmental Panel on Climate Change, Third Assessment of Climate Change, United Nations Environmental Program/World Meteorological Organization (UNEP/WMO) Assessment of Ozone Depletion, and NARSTO Assessment of Surface Level Ozone*

Subject: *Intergovernmental Panel on Climate Change (IPCC) Assessments of Climate Change for the United Nations Framework Convention*

Q2 Provide scientific leadership in authoring and reviewing the year 2001 state-of-the-science assessment of climate change by the IPCC. (D. Albritton) AL

Subject: *UNEP/WMO Assessments of Ozone Layer Depletion for the Montreal Protocol*

Q1 Provide a report to the Parties of the Montreal Protocol on the topic of assessing the ozone depletion potentials of short-lived substances. (D. Albritton) AL

1.2.6 MILESTONE SUMMARY

Milestone totals by Strategic Planning Goal for FY2001

Organization	SHC	BSF	ASTFW	SI	DEC	MGMT	TOTAL
AL	0	0	0	2	8	0	10
AOML	2	0	3	2	2	1	10
ARL	2	0	1	0	4	0	7
CDC	0	0	0	7	1	0	8
CMDL	0	0	0	0	5	0	5
ETL	0	1	7	1	2	0	11
FSL	0	0	4	0	0	0	4
GLERL	11	1	0	2	1	0	15
GFDL	0	0	2	1	4	1	8
NSSL	0	0	5	0	0	1	6
NURP	7	4	0	0	0	3	14
OGP	0	0	0	8	5	2	15
PMEL	2	1	1	1	1	0	6
SEC	0	0	4	0	0	0	4
SG	5	4	0	0	0	0	9
HQ	0	0	0	0	0	7	7
ARO	0	0	0	0	0	2	2
SAB	0	0	0	0	0	2	2
IA	0	0	0	0	0	1	1
TOTALS	29	11	27	24	33	20	144

Milestones totals by Quarter for FY2001

Organization	Q1	Q2	Q3	Q4	TOTAL
AL	2	3	2	3	10
AOML	2	1	5	2	10
ARL	0	2	1	4	7
CDC	1	2	1	4	8
CMDL	2	1	1	1	5
ETL	1	2	1	7	11
FSL	2	0	1	1	4
GLERL	1	5	4	5	15
GFDL	0	4	3	1	8
NSSL	0	1	2	3	6
NURP	2	5	3	4	14
OGP	2	2	6	5	15
PMEL	0	2	2	2	6
SEC	0	2	2	0	4
SG	2	2	3	2	9
HQ	1	3	0	3	7
ARO	0	0	1	1	2
SAB	1	0	1	0	2
IA	0	0	0	1	1
TOTALS	19	37	39	49	144

NOTE: Shared milestones are included in all of their Laboratory or Program tallies in the above tables.

1.3 LONG-TERM OBSERVATIONS AND MONITORING

The importance of long-term observations and monitoring in oceanographic and atmospheric research is clear. Time series measurements of physical and meteorological properties, currently taken throughout the globe, have allowed investigators to resolve important scales of oceanic and atmospheric variability. In addition, long-term observations of a variety of physical, chemical and biological parameters are used to monitor the health of ecosystems and to provide a baseline against which future changes can be assessed.

Spatial coverage will ultimately come from observations made from space, but high-frequency temporal and added vertical coverage will need to come from moorings, drifters, sondes and other similar observing platforms with arrays of *in situ* sensors. Although the following observing systems and networks do not change dramatically from year to year, they are included in this plan as they are essential components of the NOAA research infrastructure.

1.3.1 SUSTAIN HEALTHY COASTS

Long-Term Trends in Lake Michigan Benthic Populations	An ongoing project initiated in 1980 that examines changes in macroinvertebrate populations at 40 sites in the southern basin of Lake Michigan. The objectives of this project are to determine trends in population abundances of benthic macroinvertebrates in selected areas of the Great Lakes and to determine the significance and reasons for any observed changes.	GLERL
Lake Michigan Ecosystem Monitoring	The primary objective of this project is to monitor and assess the health of the Lake Michigan ecosystem by examining long-term food web dynamics and indicators of water quality in order to understand and predict natural and anthropogenic causes of variability. The data from this project are used for research on the condition of and trends in Lake Michigan's ecosystem.	GLERL
Florida Bay Circulation and Exchange Study	A moored array in Florida Bay has been established in partnership with the University of Miami to monitor changes in the Shark River discharge nearfield and to measure interaction and exchange between the southwest shelf, Everglades discharge, Florida Bay, Keys coastal waters and the Florida Current. The goal of this project is to study of the interaction and exchange of Florida Bay with the connecting coastal waters of the Gulf of Mexico and the Atlantic in the Florida Keys.	AOML

1.3.2 BUILD SUSTAINABLE FISHERIES

Fisheries-Oceanography Coordinated Investigations Mooring	A key biophysical mooring on the southeastern Bering Sea shelf which documents physical, chemical, and biological variability. This mooring provides the only long-term measurements of ocean currents, temperature, salinity, nutrients, and primary production in the Bering Sea. Interpretations of these measurements enable scientists to elucidate relationships between oceanographic conditions and the biological environment.	PMEL

1.3.3 ADVANCE SHORT-TERM WARNINGS & FORECAST SERVICES

Deep-ocean Assessment and Reporting of Tsunamis Network	A network of bottom pressure recorders in the North Pacific which transmit data to a surface buoy. The surface buoy then sends the data to shore-based receivers through a satellite communications link. This real-time system is capable of detecting deep ocean tsunamis with amplitudes as small as 1 cm.	PMEL
Real Time Solar Wind	Continuous solar wind data from the Advance Composition Explorer (ACE) satellite	SEC
Space Environment Monitors	Measurements are from the NOAA GOES and POES satellites to provide advisories and forecasts of conditions on the Sun and the near Earth space environment.	SEC
Solar Backscatter Ultraviolet Sounding Spectral Radiometer	One of the longest records of the solar chromospheric activity. It operates on the POES satellite.	SEC
Aircraft Hurricane Observations	A thirty-plus year database of observations of hurricanes made by NOAA aircraft maintained for use by the hurricane research community. This database is expanded with each hurricane season aircraft observing program.	AOML/ OMAO

Wind Profiler Demonstration Network	More than thirty 404 MHz Doppler radars, primarily in the midwest United States, provide hourly observations of wind profiles. The profilers measure vertical profiles of horizontal wind speed and direction from near the surface to above the tropopause. The system also obtains temperature profiles using Radio Acoustic Soundings and total columnar water vapor using GPS techniques.	FSL
Atmospheric Integrated Research Monitoring Network	A network of 9 wet and 12 dry deposition sites around the United States provide data to help develop a mathematical technique to infer deposition velocities of sulfur and nitrogen compounds from knowledge of local meteorological conditions and vegetation characteristics. This network provides the world standard protocol for these techniques.	ARL
National Atmospheric Deposition Program/National Trends Network	NOAA operates seven stations in this approximately 200 station network addressing the problem of atmospheric deposition and its effects on agriculture, forests, rangelands and fresh water streams across the United States.	

1.3.4 IMPLEMENT SEASONAL TO INTERANNUAL CLIMATE FORECASTS

Florida Current	An undersea cable is being used to continuously measure the volume transport through the Straits of Florida. This data can then be related to heat transport by the ocean, a critical parameter for understanding the role of the oceans in climate fluctuations. In order to calibrate and verify the cable measurements, periodic direct measurements of the transport are also made.	AOML/ PMEL
Midlake Lake Michigan Thermal Structure Monitoring for Climate Change	The main objectives of this project are (1) to develop improved climatological information by means of observations, new instrumentation, and improved analyses of the distribution and variability of coastal and offshore temperatures and by studying their dependence on meteorological and hydrological forces, with emphasis on potential changes in climate, and (2) to concurrently provide data for improving numerical models that can simulate and predict the thermal structure in the lakes. It is currently part of the Episodic Events - Great Lakes Experiment (EEGLE) program.	GLERL

North Atlantic High Density XBT Lines	Two high resolution Expendable Bathythermograph (XBT) lines have been chosen to monitor the temperature in regions of the North Atlantic where sea surface temperature anomalies form and propagate.	AOML/ OGP
Equatorial Pacific Real-time Ocean Biogeochemical and Environmental Sensors	A suite of chemical and biological sensors have been deployed on the 155°W and 170°W TAO mooring array in the equatorial Pacific in December of 1996. The primary objectives of this project are to: 1) determine the relationships between physical forcing, primary production and the exchange of carbon dioxide between ocean and atmosphere; 2) determine the biological and chemical responses to climatic and ocean variability in the equatorial Pacific; 3) determine the spatial, seasonal and interannual variability in primary production, carbon dioxide flux and nutrient distributions; and 4) determine the spatial, seasonal and interannual variability of sea surface pigment distributions to groundtruth SEAWIFS satellite measurements of ocean color.	PMEL/ OGP/ MBARI

1.3.5 DOCUMENT, PREDICT, AND ASSESS DECADAL-TO-CENTENNIAL CHANGE

Tropical Atmosphere-Ocean / Triangle Trans Ocean Buoy Network Array	This array consists of approximately 70 moorings in the Tropical Pacific Ocean, telemetering oceanographic and meteorological data to shore in real-time via the Argos satellite system. The sites west of 165E are occupied by TRITON buoys maintained by the Japan Science and Technology Center (JAMSTEC). The array enables real-time collection of high quality oceanographic and surface meteorological data for monitoring, forecasting, and understanding of climate swings associated with El Niño and La Niña.	PMEL
Global Lagrangian Drifters	Drifting buoys have been deployed in all of the major ocean basins to determine mixed layer currents, sea surface temperature and shallow subsurface temperature. Using research ships, Volunteer Observation Ships (VOS), and U.S. Navy aircraft, Global Lagrangian Drifters are placed in areas of interest.	AOML
XBT Program	The Global Ocean Observing System (GOOS) Center operates a global XBT Program that utilizes approximately 70 VOS to monitor, on a monthly basis, 26 transects in all three ocean basins. The XBT is an expendable temperature probe that is manually launched from the bridge wings of commercial vessels approximately 4 times per day along certain scientifically selected shipping lanes.	AOML

Volunteer Observing Ships	The GOOS Center presently operates a global fleet of about 400 domestic and foreign commercial vessels. The GOOS global fleet mostly represents a subset of the larger National Weather Service VOS fleet consisting of over 1500 vessels. These vessels voluntarily collect sea surface meteorological, XBT, shipboard thermosalinograph or atmospheric observations. In addition to drifting buoys, they deploy highly instrumented PALACE type floats and sometimes tow Continuous Plankton Recorders.	AOML
Baseline Observatories	These four observatories at Barrow, Hawai'i, American Samoa and the South Pole collect a large suite of atmospheric observations (including radiation) and samples for determination of atmospheric constituents to document long-term trends and changes in the atmosphere.	CMDL
Baseline Surface Radiation Network	OAR is responsible for continuous measurements of a suite of solar flux parameters at six of eighteen operational sites worldwide to document secular changes in, and provide a resource for analysis of, the Earth's radiative energy budget. The sites are in contrasting climatic zones, covering a latitude range from 80°N to 90°S. Solar and atmospheric radiation is measured with instruments of the highest available accuracy and at a very high frequency.	CMDL/ ARL
Boulder Atmospheric Observatory	Since 1987 a program measuring the outwelling radiation from the earth near the surface compared with radiation measurements (over a similar footprint) at the top of the atmosphere from satellites. Because the BAO tower does not have any electronic interferences mounted on it below the top, this is the only site presently available on earth to make these measurements.	CMDL
Integrated Surface Irradiance Study	The Integrated Solar Irradiance Study (ISIS) provides basic surface radiation data with repeatability, consistency, and accuracy based on reference standards maintained at levels better than 1% to address questions of spatial distributions and time trends, at sites selected to be (1) regionally representative, (2) long-term continuous, and (3) strategic foci for the research that is now needed. ISIS operates at two levels: Level 1 (9 stations) monitors incoming radiation only, and Level 2 (SURFRAD, 6 stations) focuses on surface radiation balance.	ARL

Cooperative Air Sampling Network	This network is a globally dispersed network of over 40 sites for the collection of atmospheric samples for analysis to document long-term changes in atmospheric composition with an emphasis on regional variability. The cooperative air sampling network effort began in 1967 at Niwot Ridge, Colorado. Today, the network is an international effort which includes regular discrete samples from the 4 baseline observatories, cooperative fixed sites, and commercial ships. Measurement data are used to identify long-term trends, seasonal variability, and spatial distribution of carbon cycle gases.	CMDL
Measurements of Anthropogenic Gases & Natural Emissions from Tall Towers	This program utilizes existing tall (>400 m) towers as sampling platforms for in-situ and flask sample analyses of atmospheric trace gases. The program began in 1992, with continuous monitoring of CO_2 and 222Rn mixing ratios, wind speed and direction, temperature, and relative humidity at three levels up to 500 m on the WITN TV transmitter tower in eastern North Carolina. Weekly flask sampling also occurs with filled flasks returned to the Boulder laboratory. The WLEF TV transmitter tower in northern Wisconsin became the second site for this program in 1994.	CMDL
Trans-Pacific Profiler Network	A network of ten atmospheric wind profilers across the equatorial Pacific to observe the tropical atmospheric response to changing sea surface temperature patterns and understand the roles of tropical convection and boundary layer winds in the evolution and dynamics of the coupled ocean-atmosphere system.	AL
Upper Tropospheric and Stratospheric Water Vapor	The only long-term record (1980 to present) of stratospheric water vapor is from monthly, balloon-borne soundings in Boulder, CO, using small balloon borne frost-point hygrometers.	CMDL
Total Ozone	The Dobson Ozone Spectrophotometer has been used to study total ozone since its development in the 1920's. The observations of total ozone, the total amount of ozone in a column from the surface to the edge of the atmosphere, by this instrument is one of the longest geophysical measurements series in existence. Today, the instrument is an important part of a global effort to understand the role of stratospheric ozone in atmospheric chemistry, biological and ecological effects of solar UV radiation, climate and weather. CMDL maintains 15 stations using the Dobson Ozone spectrophotometer.	CMDL

South Pole Ozonesondes	Dobson instruments, as well as satellite instruments such as TOMS, measure ozone by detecting the amount of solar ultraviolet radiation able to penetrate through the stratospheric ozone layer. Since these instruments are inoperable at the South Pole during the dark winter, the NOAA began weekly ozone balloon soundings from the South Pole in 1986.	CMDL

2.0 BUDGET/RESOURCE INFORMATION

2.1 FY 2001 APPROPRIATION INFORMATION

FY 2001 OR&F Appropriation:	$327,466
FY 2000 OR&F Appropriation:	$297,616
FY 2001 OR&F Base:	$292,134

Increase over FY 2000 Appropriation:	$29,850
Increase over FY 2001 Base:	$35,332

NOAA Appropriation Bill

The FY 2001 Appropriations bill for Commerce, Justice, State and Related Agencies was signed into law on December 21 as part of PL 106-553 (D.C. Appropriations Act) with amendments in PL 160-554 (Omnibus Appropriations). Essentially, PL 106-553 incorporated the increases in our earlier Conference bill; and PL 106-554 enacted a 0.22% across-the-board decrease against every line item and program and included an amendment which will provide an additional $6,000K to OAR through the NMFS budget activity. Detailed information is presented below.

Highlights ($ in thousands)	Requested Increase	Appropriated
Amounts received from requested OAR increases:		
Climate Observations & Services	$24,000	$10,976
Nat. Envir. Data Archive & Access System (PAC)	$4,000	$2,000
USWRP - Hurricanes at Landfall	$1,000	$499
Norman Consolidation (PAC - w NWS)	$3,000	$3,000
Marine Aquaculture	$1,600	$594
Boulder Rent ATB	$1,500	$150
Other Adjustments to Base	$1,316	$813
TOTAL:	***$36,416***	***$18,032***
Requested increases for which OAR got no funding:		
GFDL Supercomputer (PAC)	$2,000	-$1,000
GLOBE	$2,000	--
Space Weather Information Dissemination System	$100	--
Aquatic Nuisance Species/NISA	$200	--
Fisheries Oceanography	$500	--
Seafloor Observatories	$3,100	--
TOTAL:	***$7,900***	***-$1,000***
Base Reductions:		
ARGO Floats	--	-$2,000
Marine Environmental Research Base	--	-$500

TOTAL:	***+$2,000***	***-$3,500***

Transfers:
GLERL - Not transferred to the National Ocean Service (NOS) as requested in the President's Budget.

Add-ons, earmarks, & unrequested enhancements (most described below):

Inst. for Study of Earth, Oceans, & Space (CCRC)	--	$1,996
L-T Climate & Air Quality Research Base Restoration	$1,990	--
Central California Ozone Study	$499	--
Climate & Global Change Base Restoration	--	$654
Restoration to IRI for Climate Prediction	--	$748
Ice Physics Research (Thayer School of Engineering)	$1,247	--
Research Related to Wind Profile Data	$998	--
STORM (U. of N. Iowa)	--	$349
NISA Ballast Water Studies	--	$848
Tsunami Hazard Mitigation (+ $1M for TWEAK)	--	$3,293
L. Champlain Study	--	$150
Aquatic Ecosystems (Canaan Valley Inst., WV)	--	$4,291
Ocean Exploration Initiative	--	$3,991
Open Ocean Aquaculture	--	$2,395
Marine Aquaculture (Coastal & Ocean Activities)	--	$2,993
Pacific Tropical Ornamental Fish	--	$449
SE Atlantic Marine Monitoring & Prediction (UNC)	--	$998
Hypoxia Research	--	$499
L. Champlain Canal Barrier Demonstration	--	$100
International Pacific Research Center (U. of HI)	--	$499
[Ocean Climate Studies - in NMFS budget activity]	--	[$5,987]
GLERL Base Restoration	--	$160
Sea Grant Base Restoration	--	$2,494
Sea Grant Oyster Disease Research - Base Increase	--	$499
National Center for Natural Products (U. of Miss.)	--	$1,995
U. of NH Marine Facilities (PAC)	--	$13,969
TOTAL	--	***$48,104***

2.2 PROPOSED REPROGRAMMING, OTHER FUNDING ISSUES

GFDL Reprogramming: The Conference Mark not only does not provide the requested FY 2001 $2.0M increase for full-year funding for the next-generation GFDL high-performance computing system, but reduces the GFDL funding from $5.0 M to $4.0M, a $1.0 M reduction from the FY 2000 level. This reduction has a direct impact on the funding of the new supercomputer contract that was awarded in FY 2000 to Raytheon of Garland, TX, after a long and very competitive procurement. Failure to fund this account at least at the $5M level would likely require renegotiation of the contract with Raytheon. Since there would be no opportunity

for competition, the Government would be at a severe disadvantage in such negotiations and would likely lose much of the computational benefits that it gained from this hard-fought procurement. The impact to the GFDL research programs could be devastating, given the critical importance of this new system to advance its climate and weather programs.

These programs will already be at a disadvantage due to the shortfall from the $7M request. In particular, computer model enhancements for global climate change and short-term climate predictions are certain to be delayed. Efforts to improve GFDL coupled model capabilities, a key to improved El Niño forecasts, would be delayed by several years. Similar delays would be experienced by GFDL's program to produce realistic regional climate change projections, thereby missing the 2005 IPCC climate assessment. Because of GFDL's central role in our Nation's climate and weather modeling, such a funding setback for the lab's computing initiative could cause the U.S. to lose its international leadership in these critical areas. As a result, NOAA Management has agreed to propose a $1.0M reprogramming in FY 2001 to cover the shortfall in the Raytheon contract (source TBD).

2.3 ADD-ONS/NEW STARTS/TERMINATIONS

The following is OAR's implementation plan for new starts and add-ons as identified in the FY 2001 Appropriation. (Note: where amount shown for an item is preceded by a "+," the full amount shown is new money. Remaining items received at least some FY 2000 funding.)

Descriptions of Add-Ons/Earmarks
(except for Base Restorations)

Institute for Study of Earth, Oceans, and Space (Climate Change Research Center) ($2.0M) - Climate and air quality monitoring and research, as well as meteorological and climatological modeling. This will be done through a cooperative agreement similar to the past few years. In FY 1999 and FY 2000, funding was split between a grant to the University of New Hampshire Institute for the Study of Earth, Oceans, and Space and funding for NOAA to do identified work. [First funded in FY 1999 appropriation. Never in the President's budget request.]

Central California Ozone Study (+$0.5M) - The intention was for these funds to be sent to California to be included in a general fund for the study to pay for the analysis of the data collected in the summer of 2000. It is uncertain at this point how the funds will be transferred to the grantee. [First appeared in FY 2001 Senate Report.]

Restoration to IRI for Climate Prediction (+$0.75M) - Continuing efforts to accelerate climate research at the IRI. [First appeared in FY 2001 Senate Report. This unrequested program increase is consistent with mission of the Climate and Global Change Program.]

Ice Physics Research - Thayer School of Engineering (+$1.25M) - This is a new project that will conduct research on the role of sea ice in climate variability. Specifically, research will focus on the mechanisms controlling the formation of leads (cracks and larger openings) in sea ice. The amount of open water in the leads, relative to the coverage of the ocean by ice, greatly influences the loss of heat by the polar ocean in winter and probably has effects on surface winds as well. [First appeared in FY 2001 Senate Report.]

Incorporation of wind-profile data into operational forecast models ($1.0M) - This feasibility study assesses the performance of

space based lidar technology and incorporates simulated satellite-borne lidar-derived wind profile data into operational forecast models to determine whether the accuracy of weather forecasts are improved. The majority of the research will be done in NOAA, but a portion of this study will be performed through grants. [First funded at $1.5 million in FY 1999. Never in the President's budget request.]

STORM (University of Iowa) (+$2.0M) - This is the second year of a teacher-training/education program at the Science Center for Teaching, Outreach, and Research on Meteorology (STORM) located at the University of Northern Iowa. In FY 2000, some funds for this project went to the Forecast Systems Laboratory as part of the agreement between the university and NOAA. [First funded at $2.0M in FY 2000. Never in President's budget request.]

NISA/Ballast Water Studies ($0.85M) - Ballast Water Technology Development Research in the Chesapeake Bay. Funding shall be awarded competitively through the RFP (Request for Proposals) process. [First included in FY 1998. Continued funding is requested in FY 2002 Request to the Office of Management and Budget (OMB).]

Tsunami Hazard Mitigation Program and TWEAK ($3.3M) - FY 2001 funding will represent the fifth year of support for a NOAA-led State (AK, CA, HI, OR. WA) / Federal (NOAA,FEMA,USGS) partnership to reduce the impact of tsunamis to U.S. coastlines. The funds will be used to produce inundation maps for all states; complete the upgrade of NOAA tsunami warning operations by the addition of 20 new, real time seismic sites and the installation of an array of 6 deep ocean tsunami detectors; and advance mitigation planning in each state through the creation of state infrastructure and the development of "Tsunami Ready Communities." For FY 2001, $1M was added for Tsunami Warning and Environmental observatory for AlasKa (TWEAK) to enhance the Alaska tsunami mitigation program. The funds will be used to increase the number of communities receiving inundation maps and increase the number of tsunami detectors and seismic stations in Alaska. TWEAK will also begin the development of a real time, sea floor observatory. [FY 1995 appropriations allocated $50,000 for the development of an action plan for this multi-agency, multi-state program. More recent appropriations have provided $2.3M per year. $1M was added in FY 2001 for TWEAK. Although not yet included in the President's budget request, Tsunami Hazard Mitigation is an established program at PMEL.]

Lake Champlain Study ($0.15M) - The Lake Champlain research effort is a cooperative venture between the ARL, GLERL, and the Lake Champlain Research Consortium (LCRC). The funds appropriated for Lake Champlain research (~150K per year) have been equally divided between GLERL and ARL. ARL cooperates with the LCRC to study the atmospheric transport and deposition of materials to the Lake Champlain Basin. GLERL performs studies of water and sediment transport processes within Lake Champlain. [Included as a part of appropriations since FY 1992. Although funded by the past several appropriations, it has not yet been included in President's budget request.]

Aquatic and Terrestrial Ecosystems - Canaan Valley Institute ($4.0M) - The Canaan Valley Institute at Davis, West Virginia, develops and implements locally supported solutions to threats to the sustainability of the Canaan Valley environment and its surrounding areas in Virginia, Maryland, and Pennsylvania. A focus is on integrating different aspects of environmental

concern and transmitting this understanding to the population at large. Non-competitive grants are split between construction and program operation. [Construction funds began in FY 1998. Never in the President's budget request.]

Ocean Exploration Initiative and COA Ocean Exploration (+$4.0M) - This is an interdisciplinary oceanographic program whose goal is to provide NOAA and the nation with biological, chemical, and physical knowledge of the largely unexplored global ocean, particularly that part of which lies within the U.S. Exclusive Economic Zone (EEZ). The initiative will enlist the efforts of both NOAA and non-NOAA scientists. NOAA's role is designed to complement a planned, larger-scale national ocean exploration effort which will involve other U.S. agencies and institutions. $2.0 million of the $4 million is part of the OAR regular appropriation, and the remaining $2 million is part of the new $440M Coastal & Ocean Activities (COA) section of the OAR Budget. [First appeared in FY 2001 Senate Report. Funding was provided to get a quick start on the major interagency initiative in Ocean Exploration expected in the FY 2002 President's budget request.]

Open Ocean Aquaculture ($2.4M) - Open ocean aquaculture includes engineering, biological, environmental, economic, and marketing feasibility studies. While appropriations have identified the University of New Hampshire as the grantee, program funds have been competitively distributed throughout the New England Region. [First appeared at $300,000 in FY 1997 reprogramming. It was included in FY 1998-2000 appropriations at $1.7 and $2.4 million, respectively. Never included in President's budget request. It is compatible with the President's budget request for mariculture which will be managed on a regional basis and jointly managed by a NOAA/DOC-wide Steering Committee at the national level but administered through OAR. It has been requested for inclusion in the amended FY 2002 OMB Request.]

Marine Aquaculture in Coastal & Ocean Activities (+$3.0M) - This money will be added to the ongoing OAR national competition base for aquaculture in order to expand the research, policy development and outreach activities in aquaculture. Activities supported will include further development of regional multi-discipline research teams, new species development, and establishment of regulatory frameworks for the developing aquaculture industry.

Pacific Tropical Ornamental Fish to be administered by the Hawaii Economic Development Alliance, Inc. (HIEDA) (+$0.25M) - This program promotes aquaculture for industry development and to help prevent plundering of aquarium fish from coral reefs as well as the damage to the reefs that occurs when this is done. [First appeared in FY 2000 Senate Report. Never in the President's budget request, but requested for inclusion in the amended FY 2002 OMB Request.]

Southeast Atlantic Marine Monitoring & Prediction (+$1.0M) - This is a re-enactment of the Ocean Observations at the University of North Carolina at Wilmington, which was funded at $0.75M in FY 1999. UNC-Wilmington will continue its program to study the short- and long-term influences of oceanographic and meteorological processes on the marine resources of the southeastern U.S. coastal and oceanic regions. The program will monitor and assess the physical, chemical, and biological aspects of the coastal ocean, including effects of currents and wind on both the marine environment and its resources (such as fish) on relevant time scales. The purpose of this long-term monitoring program is to create a predictive model to assess and/or quantify the effects of natural and anthropogenic

influences on coastal processes in the South Atlantic Bight.

Hypoxia Research (+$0.5M) - These funds will be used to conduct hypoxia mapping cruises and to deploy simple moorings with recording thermistor strings and one or more CTD/oxygen sensors to define the evolution and distribution of the processes/parameters governing hypoxia distribution and it's relationship to the nutrient loading associated with the Mississippi River Plume. The Louisiana Universities Marine Consortium (LUMCON) vessel, RV Pelican, would be the primary platform for this research. As a UNOLS (University-National Oceanographic Laboratory System) vessel, this will require allocation of OAR data acquisition funds for the charter costs. [Originally requested in the FY 1999 and 2000 President's budgets, it was not funded by Congress. It was not requested in the FY 2001 President's budget, but was funded by Congress]

Lake Champlain Canal Barrier Demonstration (+$0.1M) - The Vermont Department of Environment, along with other parties in the region, is participating in the planning to put up a barrier in the Lake Champlain Canal to keep out invasive fish species (and perhaps other species) that would otherwise enter Lake Champlain from the Hudson River. [Never in the President's budget request.]

International Pacific Research Center (University of Hawaii) (+$0.5M) - This funding will be used to establish a Data Research Center for Climate Studies at the International Pacific Research Center (IPRC) in Honolulu, Hawaii. The project will develop infrastructure necessary to make data resources readily accessible and usable by the international climate community. The development is in cooperation with NASA's project of data-intensive research and modeling at the IPRC as well as Japan's Frontier Research System for Global Change. This combined interagency/international effort contributes directly to the objectives of the Climate Variability and Predictability Program (CLIVAR) and the Global Ocean Data Assimilation Experiment (GODAE).

Ocean Climate Studies (+$6.0M for OAR in NMFS budget activity) - The Congress has appropriated significant new funds to NOAA for research and other activities associated with the intertwined issues of commercial fishing and marine mammal protection. The rapid decline in the western population of Steller's sea lion over the past decade is a cause for concern. One of several theories for the cause of the decline is removal of pollock by commercial fishing in the area of sea lion rookeries and haul outs. A recent decision by the NMFS has imposed stringent constraints on fishing effort in these areas. Understandably, the fishing industry is opposed to these constraints, believing that fishing is not the major cause of the population decline. The industry has pointed out other possible causes, including climate shifts and predation by killer whales. The new funds from Congress are intended to increase the scientific underpinnings for future resource management and protection decisions.

National Center for Natural Products (University of Mississippi) (+$2.0M) - The scope of the project to be supported by these funds is undetermined at this time.

University of New Hampshire Marine Facilities (+$14.0M in PAC) - Funds are provided for the Cooperative Institute for New England Mariculture and Fisheries (CINEMar), a new Joint Institute on mariculture, fisheries science and management, and marine policy. Also planned is the construction of a pier to support an NOS vessel.

2.4 EXTRAMURAL BUDGETS

OAR provides support to universities in the form of grants, contracts, and cooperative agreements for research, outreach support, technology transfer, educational development, and participation in intramural research by university scientists working in OAR laboratories. OAR's university support is provided through several programs ($M).

Mechanism	FY 1999 Actual	FY 2000 Actual	FY 2001 Estimate~
SG	$56.5M	$60.4M	TBD
OGP	17.7	18.8	TBD
NURP	11.1	9.4	TBD
JIs et al.*	20.3	20.6	TBD
ORTA (OAR SBIR)^	1.6	1.6	TBD
UNOLS (Ships)	2.4	2.4	TBD

* Numbers are based on JI fiscal year, which begins July 1. FY 2001 still undetermined.

^ Effective in FY 1998, ORTA will be issuing contracts in place of the current grants. Only some SBIR awards are to university scientists. FY2001 levels are still in the process of being determined.

~ FY 2001 estimates are in the process of being developed.

2.5 FINANCIAL AUDIT ACTIONS

OAR has taken the following actions to support NOAA in its effort to achieve and maintain an unqualified audit:

- As a result of a report from the Office of the Inspector General (OIG) on OAR management practices, OAR conducted a review of bank card practices in FY 2000. OAR implemented three actions as a result of their review. First, the policy and procedures for bank cards were discussed at the OAR-wide Budget Conference to provide refresher training to OAR personnel. Second, the OAR HQ Administrative Officer generated a master list of bank card holders, dollar thresholds, and bankcard training courses taken, providing a better tracking mechanism. Third, the Commerce Administrative Management System (CAMS) Manual was distributed to all card holders and Administrative Officers which provided an updated reference. Additional information and updates will be forwarded to the appropriate personnel in FY 2001.
- OAR has been working with NOAA Finance on two separate reimbursable projects to meet the audit corrective action plans on reimbursable task plans. One exercise is to clean up the FY 1998 and prior reimbursable task numbers with costs still remaining. The other exercise is to review the current reimbursable activity to determine if a Memorandum of Understanding/agreement is in place and reimbursable task plans have been entered. This exercise is on-going.
- OAR financial staff attended the annual NOAA Audit Conference held in Landsdowne, VA, and provided conference notes and the audit report to OAR senior management. OAR financial staff plan to attend the Audit conference scheduled in FY

2001.

- OAR has its own Grants Council, the chair of which serves on the NOAA Grants Management Advisory Council. This individual reports back to the OAR Grants Council pertinent issues and action items specifically related to Audit, i.e. delinquent reports, delayed and slow grants processing time. OAR staff is required, as part of the OAR Quarterly Review, to report on the number of grants awarded each month, the date the grant went to NOAA Grants Management Office, the date it is awarded and the number of days it took for the award to be processed. OAR must also give a status report on delinquent reports and what steps are being taken toward outstanding issues. OAR will continue in FY 2001 to be proactive in resolving the issues surrounding delinquent grant reports.

- Based on direction from the NOAA Budget Office and audit results, OAR implemented a methodology for distributing indirect costs within the line office. The indirect costs are spread using distribution rates based on federal labor. OAR financial staff participated in several discussions with NOAA on this process. In addition, several meetings were held with the OAR Financial Management Centers (FMCs) on the process and necessary analysis. An analysis tool was developed to assist the FMCs in determining the status of their indirect costs. Additional training and continued analysis will be completed in FY 2001.

- OAR financial staff attended training classes provided by Office of Finance and Administration (OFA) on Financial Operating Plans (FOPs) and the Financial Management (FIMA) accounting system. OAR staff will continue to take classes provided by the OFA staff.

- OAR Headquarters held its first OAR-wide Budget Conference in January 2000 that provided training and workshops to its financial management centers on pertinent financial issues, including overheads, distribution rates, and NOAA and OAR corporate costs. In addition, OAR Headquarters addressed issues that were pertinent to the KPMG Audit and OIG Report, including, interagency agreements, NOAA's new overhead methodology, and Inspector General (IG) concerns about bank cards.

- OAR provided the NOAA Budget Execution staff with a reimbursable tracking table that reports available funds, accrued costs, undelivered orders, and carryover for each reimbursable task. This report also lists sponsoring agency and type of funds (e.g., 2 yr., 3 yr., no yr.). In addition, each analyst has a checklist of requirements that must be completed before submitting a reimbursable task plan. This practice will continue into FY 2001.

- OAR regularly participates in the Department of Commerce (DOC) Management Control Review (MCR) process. This past year, OAR reviewed resource management, property management, and Technology Transfers at ETL. OAR will continue to participate in the process in FY 2001.

- OAR will continue to support NOAA in its effort to achieve and maintain an unqualified audit.

3.0 MANAGEMENT ISSUES

3.1 JOINT INSTITUTES RENEWAL

In its goals to fulfill the mission of NOAA, OAR will be committed to working with its eleven Joint Institute research partners to close out their current five year cooperative agreements (1996-2001). Simultaneously OAR will work with these partners in preparations of the necessary documents and reviews that will continue these highly successful research collaborations through a new set of five year plans for July 1, 2001 through June 30, 2006. These mutually beneficial partnerships increase the efficiency and effectiveness of the Joint Institute Program and enable outstanding scientists from around the world to work cooperatively with NOAA researchers.

OAR will begin its review of the plans on December 1, 2000. The plans then will be cleared through a NOAA review process and will progress to DOC for final clearances by the DOC attorneys and the DOC Office of Executive Assistance Management. Upon clearance of the DOC review boards, there is a 48-hour blackout period in which the applicable state representatives are notified by DOC of this cooperative agreement award from NOAA for the respective university or research institution within their districts.

3.2 LABORATORY ADJUSTMENTS - TO-BASE

The primary infrastructure concern for the Research Laboratories, as well as the rest of OAR, has been the issue of adjustments-to-base or ATBs. In the FY 1996-2000 appropriations OAR has received a cumulative total of only $0.3M (or about 1%) of the more than $28M of inflation adjustments needed to cover pay, rent, and other cost increases. The effect on the programs and research conducted by OAR has been serious and continues to be the top priority of this organization. A brief history of the situation follows.

For the first four years of this period (FY 1996-1999), OAR received no ATBs. In FY 1996 none of OAR's ATB requests were approved by Congress and in FY 1997 no OAR ATB requests were approved by OMB. During this period OAR made ATB requests between $5M and $8M to the Department of Commerce each year. These requests shrank at each stage of the budget process to levels far below what was needed to make proper inflationary adjustments. It was not until FY 2000 that OAR finally received a small amount of ATB funding in its appropriation.

For FY 2001, OAR initially received $2.8M of its requested ATBs through OMB; however, $1.5M of these ATBs had to be used to cover the program increase denied by OMB for the rent shortfall of the new Boulder laboratory facility. Thus far, the House has denied all OAR FY 2001 ATB requests. The Senate has approved $1.0M of the $1.3M requested for ATBs (and $0.15M of the $1.5M requested for the Boulder rent shortfall).

The reasons underlying these trends are complex. Because of NOAA's (including OAR's) dismal record of obtaining ATBs, the agency's focus has been heavily tilted toward program increases, which have seemed to stand a better chance of getting funded. This poses an additional problem for OAR and the Joint Institutes.

The Joint Institutes play a significant role in supporting the scientific activity of OAR. They bring together the resources of a research-oriented university or institution with those of

OAR and other branches of NOAA. Joint Institutes are funded through cooperative agreements, which are very different from grants in that they are not designed to provide Federal assistance but rather to support joint working agreements. These funds allow university personnel to work side-by-side with Federal employees. This situation is unique among the working relationships between universities and Federal agencies and currently does not have specific recognition within the NOAA/DoC budget structure. There is no separate object classification for Cooperative Agreements, instead they are presently obligated under object class 41. All items within object class 41 are currently viewed by the Department as not eligible for inflationary adjustments to base. Nonetheless, the Joint Institutes experience similar increases in salary and benefits as do Federal employees, and the program is threatened by the lack of ATBs for salary and benefits

Erosion of base funding has made it impossible to maintain the same level of support from Joint Institute scientists. The lack of consistent funding in the face of expanding demands for increased services and support has made it necessary in the past to request adjustments to base for the salary of the scientists at the Joint Institutes. However, no mechanism for doing so currently exists in the ATB process.

One of the key findings in the Kelly Report issued in October of 1998, was that failure to receive inflationary adjustments (or ATBs) was a major contributing cause to the base shortfall in the National Weather Service. As a result, ATBs became a NOAA priority in the FY 2000 Congressional Request, particularly for NWS and to a lesser extent for the other line organizations. In FY 2001, NOAA made ATBs a top priority across the agency; and both DoC and OMB approved the majority of these requests. NOAA, however, used part of these funds to restore the FY 2000 rescission as well as other NOAA-wide reductions in the FY 2000 appropriation. OAR took an additional reduction (discussed above) to cover the rent shortfall for the new Boulder facility. The net result for OAR was a loss of almost 75% of its originally requested ATBs by the time the NOAA budget got to Congress.

3.3 INFORMATION MANAGEMENT

OAR will focus on the implementation of the Information Technology (IT) Restructuring Plan upon its final approval by the Department. OAR will also focus on improving IT planning processes and resources management to ensure sound returns on IT investments. This includes critical areas such as IT security, capital planning, corporate IT architecture, Internet/Web management, planning for technology refreshment, and new budget initiatives.

IT restucturing is part of a department-wide initiative to organize and improve the utilization of resources spent on information technology and to empower IT personnel. DOC and its bureaus have hired Chief Information Officers (CIOs), and each of NOAA's Line Offices also have CIOs who meet regularly to plan, respond to OMB and other requirements, disseminate information, and solve problems.

3.4 FTE PLANS

OAR's FY 2000 Target of 970 included 6 new hires associated with the FY 2000 appropriation of 2 Full-Time Equivalent (FTE) employees (from the Science Advisory Board) transferred from the Chief Scientist Office to OAR. OAR will review the FY 2001 Conference Mark before making any revisions to the FY 2001 FTE Target.

OAR's FMCs are required to submit an FTE Table as part of the NOAA and OAR Quarterly Review. This table includes the Target, FTE

usage through the quarter, and projected usage through the end of the year, as well as a detailed report on expected vacancies, retirements, hires, etc. It also includes a report on non-Federal employees, i.e., contractors and joint institute employees.

3.5 ORGANIZATIONAL ISSUES

Financial Database Management System

OAR must be able to evaluate enterprise-wide the amount and level of effort being directed at national and global environmental issues. OAR leaders must also be able to make determinations on which scientific activities to curtail or terminate and which ones merit enhancement as well as have a tool to evaluate new initiatives. A return on the nation's investment must be an ongoing endeavor. The complexity of OAR Programs (over $300M in appropriations and $100M in reimbursable funds) necessitates a sophisticated decision-making tool be available for the OAR AA and Laboratory and Program Directors to set scientific priorities and evaluate success of our science enterprise.

In FY 1999 OAR embarked on the development of a system that would identify financial expenditures by strategic plan activity and scientific theme, as well as serve as a financial commitment tracking system. The OAR Financial Database Management System (FDMS) is the result of this effort. The FDMS is a Microsoft® Access based budget/finance data system developed at PMEL to meet the informational needs of managers as well as administrative/budget personnel. The system is designed to provide managers with easy access to current financial information, in a readily retrievable format, at the organizational and operating unit level. For administrative and budget staff, access to more detailed information is available and the user can customize data retrieval and report formatting to meet changing informational needs. FDMS combines local commitment data with FIMA data in a seamless, Microsoft® Windows®-based format.

FDMS was developed at an OAR Laboratory, which is one of the system's strengths. It mirrors the needs of all the Laboratories and Programs and reflects a way of thinking and "doing business" that is consistent throughout OAR. FDMS will be modified to conform to the CAMS Format when CAMS replaces FIMA. The system will be deployed OAR-wide in the spring of 2001

Sea Grant Management Improvements

Sea Grant made significant changes in its operations and procedures to implement recommendations made in the 1994 National Research Council report, *A Review of NOAA National Sea Grant Program*. Among the changes were: a simplified and decentralized management structure; an increase in participation by our partners in the decision-making and planning processes; and an implementation of a rigorous process of planning, solicitation, and peer review of research projects.

In FY 1998, Sea Grant introduced a performance-based program evaluation protocol for individual Sea Grant programs that is tied to a competitive, merit-based resource allocation. Program Assessment Teams of high-level academicians and managers focus on program accomplishments relative to written scientific and management objectives contained in program implementation plans.

Seven to eight programs are to be evaluated each year, and the highest-rated programs will receive budget increases based on their performance. In FY 2001, the programs scheduled for evaluation include Alaska, Connecticut, Delaware, Louisiana, Maine/New Hampshire (These two

programs will be reviewed together.), Puerto Rico, and Wisconsin. These evaluations will be reported on by OAR during the NOAA 4th Quarter Review.

The Sea Grant Review Panel is conducting a national review of the Sea Grant extension program. The objectives of the study are to review the capabilities and effectiveness of the current Sea Grant Extension Program organization and to recommend improvements to address better the needs of coastal resources management and sustainable development in the future. The final report is scheduled for completion during the third-quarter of FY 2001. OAR will report on the evaluations and recommendations of the Sea Grant Review Panel during the NOAA 4th Quarterly Review.

National Undersea Research Center Reviews

The reinvention of NURP, which began in 1997, was based upon a number of policy changes within the program. Key among them was the principle that the program was to carry out research relevant to NOAA's mission and national needs. The NURP headquarters office is responsible for specifying these needs in the guidelines within which the centers must work. The six undersea research centers were given the responsibility for managing and directing their programs to produce the desired research with the understanding that they would be periodically evaluated to determine their success in meeting these needs and their efficiency in managing their programs. The review schedule for the centers has been established and the first two program evaluations were completed in FY 2000. The Mid Atlantic Center will be reviewed during the 2nd Quarter of FY 2001.

3.6 DIVERSITY

In FY 2001, OAR will fully participate in NOAA's Diversity Program activities and will aggressively strengthen its own internal Diversity Program efforts. As part of its reorganization, OAR established a headquarters Diversity Program Manager position. This will allow the program to expand diversity efforts OAR-wide.

OAR also has established an OAR Diversity Council that will focus on quality-of-work-life issues within OAR as well as to support the NOAA Diversity Council and the NOAA Diversity Program Plan. OAR's Deputy Assistant Administrator (DAA) chairs the OAR Diversity Council and also serves on the NOAA Diversity Council. The OAR Council will develop both annual and multi-year plans and will develop an OAR Diversity Web Page.

Program activities will concentrate on external and internal initiatives under the guidance of the OAR Diversity Council. External initiatives will include OAR Outreach Committee activities directed to local communities at all OAR locations. Internal activities will focus on incorporating Diversity Program elements into the OAR workforce environment. OAR will implement the activities related to the NOAA Survey, Feedback, and Action Program (SFA). Specifically, workgroups across OAR will continue to develop action plans, implement resolutions of issues identified in the workgroups, and elevate issues that cannot be resolved at the workgroup level.

The OAR Diversity Program Plan will focus on the ten SFA issues that OAR employees believe most critical. To accomplish this, the established SFA workgroups will continue discussing the identified quality-of-work-life issues throughout the year. The OAR Diversity Council will work on the ten issues identified by the SFA as the areas needing restructuring and/or redefining. Quality-of- work-life issues brought to the Council by OAR employees will also be

addressed.

In addition to the above, OAR will participate in the Change Agent training and will be active in the NOAA Diversity Network Conference. Performance plans for all OAR supervisors and managers have been modified to include language addressing diversity activities.

3.7 AFFIRMATIVE ACTION

OAR will continue with the established affirmative action initiatives and will expand other areas that offer increased workplace representation potential. During the reorganization the Equal Employment Opportunity (EEO) office was elevated to the OAR Assistant Administrator level. This allows the EEO office oversight activities to expand by documenting vacancy recruitment and selections for all of the OAR operating units and program offices. The office will also document quarterly progress in hires, promotions, separations, training, awards, and resources devoted to EEO. An EEO element in performance plans will be included for all OAR supervisors and managers. As part of the targeted recruitment efforts postdoctoral employees will be monitored for under representation of minorities, women, and the disabled.

OAR is adequately staffed to meet programmatic requirements for FY 2001. OAR's focus is on developing future employees through targeted recruitment using the postdoctoral program for science positions and the Practical Hands-on Application to Science Education (PHASE), and Student Educational Employment (SEEP) programs for undergraduate student positions. OAR will review the recruitment and selection process of these two programs in order to promote affirmative action goals. Quarterly assessments will be made of under-represented groups by occupation/career path, including the identification of organizational components with severe under-representation and the development of targeted recruitment plans

Other major outreach activities include working with community organizations such as minority serving institutions and collaborating in joint projects with Historically Black Colleges and Universities, Hispanic Serving Institutions, and Tribal Colleges to expand opportunities to place students. The EEO office will also continue outreach efforts to the American Indian Science and Engineering Society (AISES), the Mathematics, Engineering, Science Achievement (MESA) program, and the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), expanding its efforts to ensure inclusion of all under-represented groups. Outreach efforts in the local community at the various laboratory locations will be documented in the laboratory quarterly reports.

The EEO Committee will be fully restructured and renamed the OAR EEO Council. The OAR EEO Council along with the OAR Diversity Council will then mirror the structure and activities of the NOAA EEO Council and NOAA Diversity Council. Each council will develop a yearly work plan and continue to develop individual laboratory and program office web pages. Special joint EEO and Diversity studies will be conducted to improve management's understanding of employee concerns. A planning committee from both councils will begin designing a joint conference to be held in Boulder during FY 2001.

3.8 EMPLOYEE DEVELOPMENT & TRAINING

OAR Salary/Benefits.....$75,321,000
OAR Training and Development.....$1,209,035
Percent of Total.....1.60%

(NOTE: The above figures are projections based

on the FY 2001 figures assuming a 3.7% FY 2001 salary increase. OAR's total salary and benefits will be approximately $75,321,000.)

OAR's Employee Development and Training includes a wide range of training and developmental opportunities, such as courses in management, budget, computer, scientific fields, and other subjects, all intended to broaden, develop, and sharpen employee skills and performance. Professional staff development is also provided via participation in major domestic/international seminars sponsored by such organizations as the American Meteorological Society. In addition, OAR offers opportunities for automated data processing technical training, individual employee nighttime university educational classes, and individual employee 2- or 3-day employee development training classes during working hours. In FY 2001, OAR employees will participate in the Office of Personnel Managment's (OPM's) development training programs. Moreover, OGP is planning a retreat to foster communications and teamwork, while OAR Headquarters is planning a Budget/Administrative Conference to bring together its field and headquarters support staffs in developmental training sessions. Finally, OAR also provides opportunities for rotational assignments to Sea Grant Colleges and NOAA Headquarters staff.

Leadership Competency Development Program

OAR and NESDIS have begun a pilot NOAA Program, the Leadership Competency Development Program (LCDP) to develop better leader within our agency through training, education, and development within and across organization lines The purpose of the OAR LCDP is to develop a pool of highly skilled individuals and leaders who are representative of a diverse workforce to meet the requirements of OAR senior level and executive positions becoming vacant in the next three to five years.

The OAR LCDP will provide training and a series of developmental experiences for participants. The participants were chosen because of their high potential for assuming executive level, leadership responsibilities in senior scientific positions which could potentially need to be filled in the next three to five years within OAR. This is not a job guarantee, but rather a foot-up on the ladder if and when positions become available.

This formative program, to be completed over an 18 to 24 month period, will include the following: a 360-degree analysis; Individual Development Plans (IDPs) to lay the groundwork and plan how each person will gain appropriate skills/experience; formal training in a range of subjects/issues facing OAR and NOAA leaders in career-broadening rotational assignments; and a formal mentor program.

Postdoctoral Research Program

(Note: The Postdoctoral Research Program is not included in the totals above, but is part of overall employee development. OAR has removed the program from the totals because the program's participants are not NOAA employees.)

The NRC administers the NOAA Postdoctoral Research Associate Program through a contract. NOAA has been part of the program since 1970, when the OAR Environmental Research Laboratories first entered the program. NOAA is one of 30 Federal agencies who participate.

The program provides research opportunities for postdoctoral scientists of unusual promise and ability to work on problems that are compatible with the interests of NOAA. Participating laboratories receive a stimulus to their programs by the presence of highly educated, recent doctoral graduates and senior investigators with

established records of research productivity.

Several NOAA line offices participate in the program. As a result, NOAA has over 231 Research Advisers in 35 participating laboratories and centers in 22 different geographic locations. Programmatic funds available for "base-funded" slots are $816,000 for OAR and an additional $162,000 for the National Marine Fisheries Service. In addition, individual laboratories and centers are estimated to add additional funds of approximately $1,300,000.

3.9 ENVIRONMENTAL COMPLIANCE & SAFETY

As an integral part of our mission, OAR accepts responsibility for environmental and natural resource stewardship for present and future generations and for providing safe and healthful working conditions for its employees. All hazardous materials and wastes located at OAR facilities will be properly identified, handled, and disposed of in accordance with a reasonable interpretation of the complex body of NOAA, State, and Federal regulations and laws (at least a dozen applicable Federal acts).

Environmental Compliance & Safety Structure

The Director of each OAR laboratory or program facility is responsible for ensuring that program activities are routinely conducted in a safe and environmentally compliant manner and that required funding for doing so is requested. The Director is responsible for: knowing which, if any, hazardous materials are used, stored, or disposed of by the facility; identifying in a timely fashion any environmental deficiencies that may occur; and reporting such problems concurrently to the appropriate NOAA Regional Environmental Compliance Officer (RECO) and/or the Regional Safety Manager (RSM) and to the DAA of OAR.

Those laboratory or program directors whose staff deal with hazardous materials must work closely, either directly or through a specified staff person, with the RECOs, who provide technical advice, identify training requirements, arrange for requested training and environmental audits, complete the OMB A-106 process, identify deficiencies, and develop preliminary cost estimates for actions to be taken.

At OAR Headquarters (HQ), responsibility for environmental compliance and safety is delegated to the DAA. To assist the DAA, a designated OAR Environmental Compliance and Safety coordinator works with the NOAA Environmental Compliance and Safety Division staff, laboratory/program contacts, and the RECOs and RSMs to: (1) coordinate the development and updating of an OAR Environmental Compliance & Safety strategic plan, (2) obtain adequate documentation for quarterly environmental compliance and safety reporting to NOAA HQ, and (3) take steps to ensure that all OAR staff using, storing, or disposing of environmentally hazardous materials are identified, are adequately trained, and report requisite information about environmental compliance. This information is then tailored for OAR's formal reporting requirement to NOAA.

4.0 OTHER INFORMATION

4.1 LEGISLATIVE ISSUES

Our primary legislative concerns for FY 2001 are support for the President's FY 2002 budget request and authorizing language impacting NOAA programs.

We have continuing concerns about the proliferation of Congressional add-ons in our budget. The concern relates in large part to the time and expense of the management and award process. The issue is made more difficult by the Commerce General Counsel's insistence on sole-source justifications. Our goal is two-fold: (1) to ensure that we are able to make a sufficient amount of the funds appropriated for these add-on programs available to cover the full cost of our managing these awards, and (2) to ensure that, where Congress intends for specific entities to be recipients of these awards, the report language is clearly stated in so that OAR can justify sole-source awards in on the basis of Congressional mandate. Otherwise, our preference is to openly compete these awards.

We also continue efforts to explain OAR to Congress through cooperative staff briefings, site visits, and projects with our university partners. OAR scientists did over 80 staff briefings and participated in site visits in Miami, Baltimore and Houston during the January-to-September, 2000 time period.

4.2 MINORITY SERVING INSTITUTIONS

The NOAA Minority Serving Institutions (MSI) Council was established by Dr. D. James Baker in 1999 and is chaired by the OAR DAA to promote and coordinate the MSI initiative in NOAA. The mission of the Council is to work towards strengthening educational opportunities and participation of the Historically Black Colleges and Universities, Hispanic Serving Institutions, and Tribal Colleges and Universities communities in the areas of Atmospheric, Oceanic, and Environmental Sciences (AOES).

The NOAA MSI Initiative in the FY 2001 President's Budget calls for the following activities:

- Cooperative Science Centers
- Graduate Fellowship Program
- Environmental Entrepreneurship Program
- Students Fellowships.

The NOAA MSI Council will focus on including all minority serving institutions in NOAA's efforts to build capacity for minority educational opportunities in the AOES by providing full opportunities and participation using an open and competitive process for funding. The Council's mission will help ensure a diverse NOAA workforce in the 21st century.

The council members are NOAA's DAAs, a representative of the Office of the Administrator, and the directors of the OFA, Human Resources Management Office, Office of Civil Rights, and Office of NOAA Corps Operations. Accomplishments of the NOAA MSI Council will be reported each quarter by OAR in the NOAA Quarterly Reviews.

4.3 VALIDATION FOR GPRA

The purpose of the Government Performance and Results Act (GPRA) (Public Law 103-62) is to provide for the establishment of strategic planning and performance measurement in the Federal government. In accordance with GPRA's purpose, OAR will validate and verify

its performance measurement activities in its FY 2001 Operating Plan in the following ways:

NOAA Quarterly Reviews
The Operating Plan lists milestones and performance measures for the fiscal year. Through written and oral reports delivered at the Quarterly Reviews, NOAA will verify that OAR's milestones and performance measures have been achieved.

External Program Reviews
The science of several OAR programs will be validated through external program reviews by panels of experts drawn from such sources as the National Academy of Sciences and the NRC, through peer review of proposals, and through the publication of articles in refereed journals. Programs will be reviewed at national and international scientific conferences. In addition, the Climate and Global Change program will be evaluated through an independent review by the NOAA Panel on Climate and Global Change. This panel includes scientists as well as stakeholders or users (e.g., from the IPCC and the United Nations Environmental Program). Success and deficiencies in quality, approach, and methodology will be addressed by the Panel.

Peer Review of Proposed Research:
OAR requires peer reviews (both mail and panel) for all proposals funded by its grants programs. In addition, the Laboratories maintain internal peer review processes for determining and maintaining the quality of their research projects. Peer review panels meet the terms of the Federal Advisory Committee Act (FACA). OAR laboratories, OGP, state Sea Grant programs, and NURP Centers undergo periodic peer review of their management and scientific programs to insure that they support efficient, ethical use of Federal funds, are of high scientific quality, and address and contribute to the accomplishment of the goals of the NOAA Strategic Plan.

Field Experiments
OAR scientists conduct field experiments to meet the organization's mission and objectives. OAR will rely on reports immediately following these field experiments and also on formal publications of results. There is a normal lag time of a year or more with such publications.

New Equipment & Systems
New technological capabilities are crucial to effective scientific experiments. OAR will rely on reports that new equipment and systems have been put into place, indicating the initial benefits experienced.

New Analytic Techniques
OAR will rely on written descriptions of results of newly implemented techniques.

Laboratory & Modeling Experiments
OAR will rely on reviews of written confirmation of laboratory experimental and modeling results.

Validation of Forecasts
Validation includes retaining the entire data set of forecasts made, generating accuracies, skill scores, and statistics and reporting these to the public routinely.

New Observational Sensors
OAR will rely on written confirmation of sensor installation and initial results.

Scientific Assessments & State-of-the-Science Reports
OAR will rely on actual physical delivery of such reports and the substantive reception they receive.

New Observational Sites and Centers

OAR will rely on written confirmation of their opening or start-up and on initial benefits.

Demonstrations

OAR will rely on analytic reports for completed demonstrations and their anticipated beneficial impacts.

4.4 CUSTOMER SERVICE PLANS

Each of OAR's principal research programs, the twelve research laboratories, Sea Grant, OGP, and NURP, have developed Customer Service Plans in fulfillment of requirements under Executive Order 12862 and the National Performance Review. Each entity communicates with customers in five major categories (internal NOAA, other governmental, non-governmental, nonprofit, commercial, and general public) and has listed ways in which it communicates to these classes of customers, and how it facilitates feedback from those audiences.

OAR External Affairs

- Publish Samples, a quarterly OAR newsletter for and about OAR people and projects that enhances internal communications.

- Working with Sea Grant Extension Service to enhance and extend outreach activities.

- Submit input for the redesign of the web pages to make it more useful, lively and engaging to the general public and other classes of OAR customers. Contribute to the development of the In the Spotlight section.

- Expand outreach to constituents by expanding the range and frequency of External Affairs contacts with appropriate organizations.

Areas of focus for FY 2001 Customer Service identified by individual OAR research entities:

Aeronomy Laboratory

- Co-Lead the authorship of two chapters, the Technical Summary and the Summary for Policymakers, of the IPCC Third Assessment Report, "Climate Change 2000: The Science of Climate Change," which presents an assessment of the state-of-scientific-understanding on the topic of climate change and will be used by decision makers in governments and industry worldwide. Comments and feedback from hundreds of expert reviewers, many governments, the private sector, and the public were received during the extensive review process associated with the preparation of this document.

- Participate in the preparation of an inter-Agency fact sheet on contrails. The fact sheet will be used by the Agencies (NOAA, Environmental Protection Agency, National Aeronautical and Space Administration (NASA), Federal Aviation Administration) to address inquiries from the public and other customers on the topic of aircraft contrails. Design of the fact sheet and decisions about the content of the fact sheet reflect the types of questions and feedback encountered from customers on this topic.

- Work with partners in other federal agencies, state agencies, industry, and universities to develop a plan for the preparation of a "state-of-understanding" scientific assessment focused on the air-quality issues associated with atmospheric particulate matter. Early involvement of all customers in the

planning/preparation process provides an effective mechanism for customer involvement and feedback.

< Publish the quarterly AL newsletter (On the Air!) and distribute it to appropriate individuals in OAR and in the broader NOAA community.

< Amend the AL web page with updates of milestone accomplishments and other information needed by NOAA colleagues.

< Make copies available of the AL summary report (The NOAA Aeronomy Laboratory: 1993-1998. A Summary of the Past Six Years and a Look Ahead), the AL summary 2-pager, and other information describing the mission, scope, and accomplishments of AL's scientific research.

< Communicate research findings by publishing papers in peer-reviewed journals and giving presentations at key national and international meetings (input to other NOAA research efforts in OAR, NESDIS, NWS).

< Serve on national and international scientific panels and boards, including serving as Co-chair of the new activity of the International Global Biogeochemical Programme's Intercontinental Transport and Chemical Transformation activity, and serving on the SPARC Steering Committee.

< Serve as Science Advisor to the United Nations Montreal Protocol regarding the stratospheric ozone layer.

< Serve as Co-chair of the Science Assessment Panel of the Montreal Protocol. Attend meetings of the Montreal Protocol's Open-Ended Working Group to provide scientific information and to keep apprized of evolving information needs of the Parties to the Montreal Protocol.

< Take leading roles in coordinating and planning activities of the NARSTO (North American Research Strategy for Tropospheric Ozone) research consortium of scientists/state and local air quality managers/business leaders in setting research priorities related to air quality issues.

Air Resources Laboratory

< Improve the understanding of the atmospheric parameters by continuing to measure/monitor fluxes of CO_2 and other gases.

< Participate in the leadership of the interagency and multi-state process to construct a coherent program to generate policy and regulatory strategies addressing ammonia pollution in coastal environments. As an immediate step in this process, lead the 2000 Shared Resources Workshop on Coastal Ammonia Pollution at Dewey Beach, Delaware, in mid November 2000. This workshop will assemble people from state and federal agencies, universities, Non-Governmental Organizations, and the private and commercial sectors.

< Continue the development of air quality and regulatory models (for both assessment and prediction), with emphasis on community models whose development is shared across a broad spectrum of academic and private institutions.

< Work with the Museum of Science and Technology (Oak Ridge, TN) to implement an advanced outreach program involving ARL scientists, educators, and local TV outlets. The focus of the program will be on meteorology and air quality affecting the Great

Smoky Mountains and in the ridge-valley topographic regime that typifies the Tennessee River Valley.

< Further develop the Realtime Environmental Applications and Display sYstem (READY), the web-based mechanism for informing the public about the latest ARL research and models, and for making the models available for external use. Assemble and summarize feedback received from READY users (worldwide, from all sectors of society).

< Improve and streamline the processes by which data are made available from ARL's various research monitoring programs, related to the surface energy budget, the biospheric sequestration of atmospheric CO_2, and the loading of pollutants delivered to ecosystems by the atmosphere.

Atlantic Oceanographic and Meteorological Laboratory

< AOML scientists will continue to attend meetings with the local Florida waterfront councils to explain methodologies, results, and answer questions of dredge operations and effects work in near shore waters.

< AOML's Hurricane Research Division has improved the wind analysis programs provided to the National Hurricane Center during all land falling Atlantic storms. This is available on the web and is frequently used by insurance companies.

< Hurricane researchers have established relations with the press to improve their understanding of hurricanes and related research.

< Our Web site and main page are being redesigned this year. Major goals of the new page include logical access to AOML's databases, a better organization of our research by themes as opposed to research divisions, and a search engine for our site. We also plan to employ a web statistic program to monitor the frequency of use.

< In an effort to increase OAR's visibility in our local community, AOML will conduct constituent briefings to Florida representatives, US Congressmen, Senators, and the governor's office throughout the year.

< The lab brochure consisting of one-pagers on each of our four research themes will be updated for general distribution. We are also working on one-pagers describing the major projects for each of our PI's, suitable for general distribution as well.

< To date, seven meetings have taken place along the east coast of Florida to promote community awareness of Project ACCESS (Accelerated Coastal Community Environmental Science Service). This is a NOAA driven effort to bring together coastal organizations, businesses, research institutes, utilities, and any other entity interested in sharing coastal atmospheric and oceanographic observational data in local communities. Surveys are distributed to discern which data is most needed.

< An education project with the local newspaper (circulation of 3,600) begins this school year, describing the Virginia Key Science Community (AOML, NOAA's Southeast Fisheries Science Center, University of Miami's Rosenstiel School of Marine and Atmospheric Science, Sea Grant, and Seaquarium) and the local estuary, Biscayne Bay. Educational facts about the bay and research in the area will run on a

weekly basis and will eventually be compiled into a booklet for distribution.

< Student internship programs continue this year, with the addition of a required statement of expectations at the beginning of the year, and a summary of experiences at the end of the year.

Climate Diagnostics Center

< Revise the CDC Web Site to improve the ease with which diverse users can find information of interest. Improvements will be made in the layout of the home page by dividing the content into logical subsections. Navigation of the site will be improved through an enhanced search interface and a comprehensive site map. Many underlying aspects of the web site are being standardized to create a more consistent look and feel to the web interface, which should aid users in anticipating how to access information in a consistent manner. In addition, the web site is being carefully analyzed and updated for compliance with NOAA, DOC, and Federal accessibility standards.

< Coordinate a set of meetings with our Western Water Assessment constituents, comprising water managers, agricultural interests, and forestry officials throughout the Rocky Mountain region. CDC plans include spring and fall workshops to communicate with these groups on a regular basis and to solicit their feedback in a timely manner. Meetings will be supplemented by field visits to understand how climate products can be tailored to better meet the constituents' needs. In some instances, CDC will create experimental forecast discussions, tailored to the users' needs, with the goal of increasing the utility of the often complex climate information.

< Continue development of educational materials to display in the hallway next to the CDC map room. These displays will tell the story of how CDC research is used to: (1) improve long-range forecasts and (2) better understand the impacts of climate variability, especially as these relate to the ENSO phenomenon. The displays will be utilized by individual visitors, tour groups, and open-house events. CDC has already created an English language El Niño poster for use in outreach efforts. The poster will be translated into a Spanish language edition to help reach an even broader audience.

Climate Monitoring & Diagnostics Laboratory

< CMDL will further develop their global air sampling network and vertical profiling network in the United States to measure greenhouse gases for climate studies. The information obtained from these activities are crucial to climate modelers and, ultimately, policy makers.

< In conjunction with AL, CMDL will extend its research of the past two years into the possible sources of unexplained excess absorption of solar radiation in cloud masses.

< Participate in national and international programs devoted to studying climate change issues in the Arctic, including the Arctic Monitoring and Assessment Program (AMAP), the International Arctic Science Committee (IASC), the Study for Environmental Arctic CHange (SEARCH), the Arctic Climate and Impact Assessment (ACIA).

< Continue to offer access to CMDL observatory sites to NOAA, other U.S. government, university and international groups for instrument calibration and measurement campaigns.

< Provide management and scientific guidance

for the continued development of the World Climate Research Program's BSRN, which provides surface based solar and infrared irradiance observations for climate research applications on a global international scale.

< CMDL scientists co-author a chapter of the SPARC Assessment of Water Vapor in the Upper Troposphere and Stratosphere. This report will be distributed to the international scientific community and provide information for policy makers through the IPCC process.

< Provide information on the state of the atmospheric ozone layer, including the monitoring of the predicted stratospheric ozone layer recovery in response to the phasing out of ozone-destroying substances. This includes the monitoring of the Antarctic ozone hole in its annual development and long term change. This information is used within NOAA and by other governmental entities and is communicated to the general public through the NOAA Office of Public Affairs.

< Involvement of CMDL scientists in the preparation of (at least 3) chapters of the Scientific Assessments of Ozone Depletion and the IPCC document on Climate Change.

< Maintain an active airborne program, which generates and archives *in situ* measurements of trace gases in the upper atmosphere through NASA sponsored missions. This data set is used by NASA to valid global satellite measurements, and by the scientific community at large to test atmospheric dynamics and chemistry within 2-D and 3-D models. These models are crucial to understanding and predicting ozone loss and climate change.

< CMDL scientists are collaborating with James Rattling Leaf of the Sinte Gleska University on the Rosebud Indian Reservation in South Dakota, to develop an atmospheric sciences program at the university. Mr. Rattling Leaf was employed at CMDL while he was attending the University of Colorado and was hired by Sinte Gleska upon graduation. He will be visiting CMDL to work on developing an atmospheric sciences curriculum.

< CMDL will increase participation in the VOGNET program created by a scientist at the Mauna Loa Observatory. This program involves Hawaiian schools studying volcanic pollutants.

< Continue the service of providing the U.S. solar radiation calibration standard to the WMO's Region IV. This allows research institutions from around the entire county to be provided with state-of-the-art instrument calibrations tied directly to the international world standards maintained at the World Radiation Center in Davos, Switzerland.

< Continue providing data from our Arctic operations to an ever-growing community of researchers concerning the potential climatic consequences of rapid climate change in the Arctic. The data from the CMDL Barrow, AK Observatory are unique in the duration and completeness in this region.

< Provide integrated data products for carbon dioxide (GLOBALVIEW-CO_2) and methane (GLOBALVIEW-CH_4). These products are synthesized from data contributed by most national laboratories making tropospheric measurements of greenhouse gases. These comprehensive data sets are used to quantify terrestrial uptake of CO_2 and to identify methane sources amenable to mitigation.

- < Make data available to archive centers such as the Carbon Dioxide Information and Analysis Center (Oak Ridge, TN) and the WMO's World Data Centers, and to the general public from the CMDL world wide web page.
- < Enhancement of the CMDL website to include interactive displays for scientists and the general public including access to real time data from observatories and field programs.

- < Continue the development of communication with State of Alaska resource agencies conducting climate change impact studies and educating middle and high schools in Barrow, Nome, and St. Paul on possible local impacts due to increasing UV measured by CMDL in their communities.

- < Continue working closely with local Barrow, AK schools by continuing regular field trips to the Barrow Observatory and giving classroom presentations that augment their curriculum.

- < Direct interaction with the public, including lab tours, community lectures, and participation in local science festivals.

Environmental Technology Laboratory

- < Work with Center for Technology Commercialization, Inc., a non-profit group from Massachusetts, to develop a new Cooperative Research And Development Alliance (CRADA).

- < Continue summer hire program of science students from local Boulder County high schools and Atlanta, GA public schools.

- < Work with Spelman College to enhance their physics program by providing guest speakers from ETL for their students and encouraging their students to work at ETL during the summer.

- < Expand current interactions with NCAR in atmospheric lidar research by joint projects and scientist to scientist interactions.

- < Continue the development of better ties/communication with NESDIS through the North American Atomospheric Observing System (NAOS) and TROIKA (A group of three NOAA Line Offices - NESDIS, OAR, and NWS).

Forecast Systems Laboratory

- < Continue to monitor new technology advances for the Advanced Weather Interactive Processing System (AWIPS) application in order to maintain the system's efficiency and cost-effectiveness.

- < Continue research on the Scalable Modeling System, which enhances the ability to run weather models in parallel architectures and provides source code portability between a large subset of existing massively parallel processors.

- < Continue heavy involvement in the North American Observing System (NAOS) program, with the goal of designing an improved composite observing system for the next century.

Geophysical Fluid Dynamics Laboratory

- < Continuing research collaborations by many GFDL scientists with researchers within NOAA and in other agencies, the academic community, and other research institutions around the world.

- < Continuing support, within limitations of available personnel resources, for research and operational applications at various sites around the world. In the case of the Modular

Ocean Model, this involves several hundred researchers who are using the model. In the case of the Hurricane Prediction System, GFDL scientists are providing assistance to several operational sites, including the National Centers for Environmental Prediction of NWS, the Navy, and several operational centers overseas.

< Leadership activities by several GFDL scientists for the preparation of the IPCC Third Assessment Report, "Climate Change 2000: The Science of Climate Change." One scientist is the coordinating lead author for one chapter, while another is co-author of another chapter of this critical climate assessment report.

< On-going activities to develop high-quality visualizations and animations to display and explain GFDL's computational climate/weather research to the public. Samples of these graphics are provided at the GFDL web site, which is often used by the media as a source of visuals for articles on climate and weather.

< Support for Princeton University's Atmospheric and Oceanic Sciences Program through teaching, advising graduate students, and collaborative research involving faculty and program scientists.

< Educational Outreach: continue classroom presentations in local schools; provide teacher workshops in weather and climate topics, and coordinate with organizations and universities that provide teacher workshops.

Great Lakes Environmental Research Laboratory

< Expand and strengthen linkages with Great Lakes Sea Grant Network outreach and extension to encourage wider access to GLERL products, services, and expertise.

< Seek out and utilize input from Sea Grant outreach and extension to identify emerging resources issues of concern to constituents and to meet such needs in our products, services, and expertise offered.

< Promote internal interactions with other NOAA line office components regionally and nationally.

< In conjunction with the dedication of the Thunder Bay National Marine Sanctuary on October 7, 2000, provide Research Vessel Shenehon to support remotely-operated-vehicle surveys of shipwrecks for the Secretary of Commerce, the NOAA Administrator, and state and local officials.

< In partnership with Michigan Sea Grant and GLERL's Cooperative Institute for Limnology and Ecosystems Research, host the Fourth Annual Midwest Regional Competition of the National Ocean Sciences Bowl on February 10, 2001.

< Host a Great Lakes tour for Members of Congress and/or staff during August 2001 in partnership with the Great Lakes Commission, the Great Lakes Fishery Commission, and the U.S. Geological Survey (USGS) Great Lakes Science Center.

< Hold public open house on GLERL's research vessel Shenehon on August 16, 2001 in conjunction with the Tall Ships visit to Muskegon, Michigan.

< Provide scientific products, services expertise and/or collaboration with the International Joint Commission, Great Lakes Fishery Commission, Great Lakes Commission, EPA Great Lakes National Program Office, Army

Corps of Engineers, and the U.S. Coast Guard.

< Continue to support GLERL's Summer Internship Program for college students to gain experience by working at GLERL under the mentorship of an individual scientist or professional. Summer fellowships are available in a broad range of fields, including plankton ecology, aquatic and benthic biology, freshwater limnology, electronics engineering, computer science, chemistry, fish ecology, scientific outreach, and library science.

< Continue to support GLERL's Partners For Excellence Program with the Ann Arbor Public School system by hiring high school students during the summer and mentoring them in the field of aquatic and related sciences.

National Severe Storms Laboratory

< Host annual open house with NOAA Weather Partners, which are the three other NOAA organizations in Norman. The general public is invited to this event and people come from as far as three hours away. With our publicity we target school-age children from the local community and throughout the state.

< Host constituent briefings, including facility tours and presentations to targeted community groups and non-profits such as Chamber of Commerce leadership programs and civic clubs.

< Encourage scientists' participation in Web chats on such sites as USAToday.com, weather.com, and GLOBE as oppportunities arise. These have proven to be an effective outreach tool for answering direct questions from the general public and constituents on a variety of research topics. It also positions our scientists as the experts on these topics.

< Provide a free tour for the general public, conducted by a scientist, at 2 p.m. every Thursday.

< Respond to written and e-mail correspondence from the general public.

< Publish a quarterly newsletter, NSSL Briefings, which highlights current research and activities. This publication reaches internal NOAA audiences, other governmental audiences, and non-government audiences.

< Write articles for and submit photos to NOAA Report regularly to reach other NOAA employees.

< Write news releases and pitch stories to reporters that are published in local and national newspapers and aired on local and national television. These stories reach all audiences.

Pacific Marine Environmental Laboratory

< The National Tsunami Hazard Mitigation Program Steering Group will continue to work with FEMA, USGS, and the states of Alaska, California, Hawai'i, Oregon, and Washington on all three parts of the program: hazard assessment, warning guidance, and mitigation. A 5-year review of the National Tsunami Hazard Mitigation Program will take place in August 2001. Visit the page showing real-time data from the four deployed Deep-ocean Assessment and Reporting of Tsunamis buoys at URL: tsunami.pmel.noaa.gov/dartqc/WaveWatcher

< NeMO Net web site was established to provide a near-real-time system which links instruments located in the caldera of an active submarine volcano, 1 mile underwater and

about 250 miles off Oregon's coast, to the Internet. Visit the web site and view the photos at: newport.pmel.noaa.gov/nemo/realtime/

< The TAO Project has a web site displaying El Niño/La Niña data collected. The web site address is: www.pmel.noaa.gov/tao/ There is a possibility of an El Niño forming in October 2001.

Space Environment Center

< Compile detailed list of requests for changes/additions to services at annual Space Weather Week.

< Log and consider customer requests throughout the year.

< Hold special vendor meetings at Space Weather Week to focus on vendor needs; support Small Business Innovation Research (SBIR) and CRADA's with vendors in support of commercial services.

< Work with NOAA Public Affairs and Outreach Team and other labs to satisfy needs and requests of public.

< Continue to improve our web site for all users, particularly the general public.

< Enhance SEC educational offerings with: new topic papers, better "kids'" page on our website, distribution of educational posters at National Science Teachers Association (NSTA), etc.

< Create Spanish versions of poster, comic book, NOAA Space Weather Scales.

National Sea Grant College Program

< Conduct assessments of seven Sea Grant programs in Alaska, Connecticut, Delaware, Louisiana, Maine/New Hampshire (These two programs will be reviewed together.), Puerto Rico, and Wisconsin.

< Bring together, at Sea Grant Week, all the key Sea Grant partners from universities, states, NOAA, and other federal agencies to meet and plan for the future.

< Work with NSSL to demonstrate the three-dimensional rainfall model in the Carolinas, which will improve flood forecasting in those hurricane prone states.

< Move the Hurricane Mitch program forward under the leadership of Puerto Rico Sea Grant by establishing an extension program in Honduras and Nicaragua over the next two years.

< Work with the Sea Grant Extension Review Committee to complete a study of the national Sea Grant Extension.

< Take part in the planning of Coastal Zone 2001 and participate in the conference.

National Undersea Research Program

< A prototype project will be conducted in the proximity of the Aquarius Undersea Laboratory on the application of a transportable telepresence imagery technology in a NOAA National Marine Sanctuary. The project is a partnership between NOS, the Institute for Exploration, and NURP and will provide outreach and exploration experiences on a real-time basis at Aquarius.

< The ALVIN submersible and its support ship Atlantis will hold an open house in Florida in late October. The ALVIN is a 4,500 m depth capable submersible that is used extensively by researchers. Secretary Mineta has been invited to this open house.

< NURP has developed educational posters and information packages for distribution to community organizations nationwide to foster a greater understanding and appreciation for NURP-sponsored research essential for the wise use of oceanic, coastal, and large lake resources through advances in undersea exploration, sampling, observation, and experimentation.

Office of Global Programs

< Foster greater involvement with NSTA.

< Take active part in "Passport-to-Knowledge" - a live, interactive broadcast is planned for March and April 2001. "Live from the Storm" will include live transmission from on-board the NOAA vessel Ka'imimoana. (Joint OAR & NWS funding with production and technical support from OGP.)

< OGP representative Dr. John Kermond now serves on the Advisory Council for the NSTA Exxon Mobil Program "Building a Presence for Science". Already 15,000 packages have been sent out to the points-of-contact and the key leaders of this new program.

< OGP has acquired all of the residual copies of the NASA/NSF/NOAA funded publication "Consequences." The entire set is being repackaged and will be given to teachers at NSTA events, starting in Boise, Idaho and culminating at the national meeting in St. Louis, MO in late March 2001.

< OGP will continue the wide distribution of the mini-CD that describes the Seasonal-to-Interannual Climate Variability program of the office.

< OGP will reproduce the 9-minute video "Dances of Sea and Sky" for mass distribution at the NSTA National Meeting in St. Louis, in March, 2001. This program first aired on the Baltimore-based Learning Channel on July, 17, 2000 and can be viewed from the OGP web site.

< OGP will continue through 2001 to offer streaming video from its website. The different video offered each month will also be archived and continuously available.

5.0 Annual Operating Plan Approvals

Concur with FY 2001 OAR Operating Plan:

David L. Evans / Signed

David L. Evans Date
Assistant Administrator, OAR

Scott Gudes / Signed

Scott B. Gudes Date
Deputy Under Secretary for
Oceans & Atmosphere

Appendix A: Acronyms used in this document

ADP - Automatic data processing
AEOS - Atmospheric, Oceanic, and Environmental Sciences
AIRMon - Atmospheric Integrated Research Monitoring Network
AL - Aeronomy Laboratory
AOML - Atlantic Oceanographic & Meteorological Laboratory
ARC - Applied Research Center
ARL - Air Resources Laboratory
ARO - Arctic Research Office
BSRN - Baseline Surface Radiation Network
CAMS - Commerce Administrative Management System
CDC - Climate Diagnostics Center
CINEMar Cooperative Institute for New England Mariculture and Fisheries
CIO - Chief Information Officer
CLIVAR - Climate Variability and Prediction (Program)
CMDL - Climate Monitoring and Diagnostics Laboratory
CRADA - Cooperative Research And Development Alliances
DAA - Deputy Assistant Administrator
DOC - Department of Commerce
EEO - Equal Employment Opportunity
ETL - Environmental Technology Laboratory
FEMA - Federal Emergency Management Agency [USA]
FDMS -
FMC - Financial Management Center
FSL - Forecast Systems Laboratory
GFDL - Geophysical Fluid Dynamics Laboratory
GLERL - Great Lakes Environmental Research Laboratory
GOOS - Global Ocean Observing System
GPRA - Government Performance and Results Act
GRIDS - Ground-based Remote Icing Detection System
HPCC - High Performance Computing Center
IA - Office of International Activities
IPCC - Intergovernmental Panel on Climate Change
IPRC - International Pacific Research Center
ISIS - Integrated Solar Irradiance Study
IT - Information Technology
JAMSTEC - Japan Science and Technology Center
JI - Joint Institutes
LCDP - Leadership Competency Development Program
LUMCON - Louisiana Universities Marine Consortium
MCR - Management Control Review
MSI - Minority Supporting Institutions

NAOS - North American Observing System
NAPAP - National Acid Precipitation Assessment Program
NARSTO - North American Research Strategy for Tropospheric Ozone
NASA - National Aeronautical and Space Administration
NeMO - New Millennium Observatory
NOAA - National Oceanic and Atmospheric Administration
NOS - National Ocean Service
NRC - National Research Council
NSSL - National Severe Storms Laboratory
NSTA - National Science Teachers Association
NURP - National Undersea Research Program
OAR - Office of Oceanic and Atmospheric Research
OAR HQ - Office of Oceanic and Atmospheric Research Headquarters
OFA - Office of Finance and Administration
OGP - Office of Global Programs
OIG - Office of the Inspector General
OMAO - Office of Marine and Aviation Operations
OMB - Office of Management and Budget
OPM - Office of Personnel Management
ORTA - Office of Research and Technology Applications
PCB - Polychlorinated biphenyl
PM - Performance Measure
PMEL - Pacific Marine Environmental Laboratory
READY - Realtime Environmental Applications and Display sYstem
RECO - Regional Environmental Compliance Officer
RSM - Regional Safety Manager
ROV - Remotely Operated Vehicle
SAB - NOAA Science Advisory Board
SAR - Synthetic Aperture Radar
SEC - Space Environment Center
SEM - Space Environmental Monitor
SFA - Survey, Feedback, and Action Program
SG - National Sea Grant College Program (aka Sea Grant)
SMIS - Science Management Information System
SPARC - Stratospheric Processes and their Role in Climate
TAO - Tropical Atmosphere Ocean
TWEAK - Tsunami Warning and Environmental observatory for AlasKa
UNEP - United Nations Environmental Program
UNOLS - University-National Oceanographic Laboratory System
USGS - United States Geological Survey
VOS - Voluntary Observing Ships
WMO - World Meteorological Organization
WSR-88D - Weather Service Radar, 88D also known as NEXRAD

XBT - Expendable Bathythermograph